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SERVING ALL INDUSTRY

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AFTER BUSINESS HOURS

What Next?

THE velvet glove! Employees arriving late for work at a factory at Krnov, Czechoslovakia, are greeted over the loud-speaker system with "Good morning—have you slept well?"

THERE are many similarities between the construction of a Stirling bomber and the creation of a woman's swim suit. This was stated by Major Harvey du Cros, who has worked as an engineer on cars and aeroplanes and now designs swim suits, when he displayed his latest effort at the International Wool Secretariat's London show "Leisure and Pleasure in Wool."

Although construction details are still on the secret list, it was revealed that the swim suit is called "This Is It, 1951" and is constructed in wool suede, "on the cantilever principle." It is printed in stripes with the words "This Is It."

The secret of making swim suits, says the Major, is not only in the fabric but also in the cut, which is worked out so exactly by the swim suit engineer that the pattern measurements and the contra stretch panels are calculated with a slide rule to the third decimal point.

IN 1873, Mary Mapes Dodge, an American author, told the story of a little Dutch boy who saved his country by plugging a leaking dyke with his finger. Year after year thousands of tourists flock to Holland to see the spot where it happened. For years the Dutch have been protesting that the story was not true. Last month, to satisfy the constant stream of American tourists who won't be convinced, the Dutch Tourist Association unveiled a bronze statue at Haarlem, showing the famous boy kneeling on a dyke at Spaarndam with his finger

stopping a leak—a statue to commemorate something that never happened!

ADVERTISING speaks for itself. It will make your business RUM, your cash register SING, your competitors WHISPER, your money TALK, your customers CRY (for more of your products), and you'll WHISTLE at the results you get.

THE American Collectors' Association has announced that from now on bill collectors would prefer to be known as collectors of delinquent obligations.

WHEN iron was first used nearly 6,000 years ago it was sometimes known as "metal from heaven" since it was extracted from meteorites. It was once a rare and precious metal, and one of the earliest known iron relics was jewellery—iron beads found in an Egyptian tomb dating back to 4,000 B.C.

TO the German language, famed for its compound words, has been added one of record length. It is "Kartoffelkaeferbwehrendienstsonderferngespraech", which means "Potato beetle defence organisation special long-distance calls." When telephone operators hear this word they must clear the line so that help can be rushed to areas where the Colorado beetle is found.

WITCH doctors in Jammu (Kashmir) have opened a ghost clinic for the treatment of persons possessed by evil spirits. Patients are placed in big earthenware urns and revolved for days. The ghost removing specialists say that it is the devil in the patient and not the patient that has a rough time in the process of the cure. One woman patient, after the treatment, went to hospital with 32 visible bruises on her body.

A horse racing society in Japan is accepting applications from women between the ages of 16 and 30 who want to be jockeys. They will be trained by male jockeys for three months before taking part in races.

HOW high is up? Once upon a time people with bronchial troubles used to head for the thin, clear air on mountain tops. Then somebody had the bright idea of taking sufferers on aeroplane rides at high altitudes where

they obtained the relief they so desired. Now comes the report from France of one Maurice Fonctionnaz, who was charged with stealing a horse. He explained to the court that he had only done it to help his whooping cough and asthma. Said he: "On a horse I'm a little higher than usual, and that lets me breathe."

IT isn't new, but like all good jokes it's worth repeating. It's a classified advertisement which, this time, is said to have appeared in a New York suburban paper. It reads: WANTED—Farmer, age 38, wishes to meet woman around 30 who owns a tractor. Please enclose picture of tractor.

DURING the recent disastrous floods in N.S.W., one family made special efforts to see that a brand new bed, complete with spotless quilt did not sustain damage. When it was all over in their district the front door swung open and two pigs, covered in mud, raced inside and jumped on the precious bed. They took a lot of removing, too.

JOHAN SADOWSKI, of Chicago, is looking for a new job. He was a boiler washer, but he put on so much weight (he is now 17 stone 3 lb.) that he can no longer squeeze through the narrow openings of boilers.

AN African employee of the Southern Rhodesia Tsetse Fly Department ran into trouble when he shot a bull elephant recently. He may have mistaken it for a tsetse fly, but we don't think so. Anyway, this wounded elephant chased him into his hut, then fell against the doorway. The hunter had to claw his way through the wall of the hut in order to get out.

A Chicago judge has ruled that if a wife wants to serve hash every night to her husband he must eat it and like it. He announced: "In the American home the woman is in sole and complete charge without interference." The hash question came up during the hearing of a domestic squabble when the husband complained that his wife served too much of it. The judge threatened to cite him for contempt of court if he didn't behave himself and eat it.

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A Parisian fortune teller, gaoled for hitting her husband on the head with a club, explained that she had read in the cards that her husband would suffer a heavy blow.

FORMER Navy diver, 27-year-old Heinz Rossler had reliable information that the fabulous treasures belonging to a high-ranking Nazi could be found at the bottom of Lake Elbssee in Western Germany. Heinz dived and dived and dived. All he found were empty Coca-Cola bottles. But he'll continue to dive because he's sure the treasure is there.

THE New Zealand Cat Fanciers' Society has protested to the Auckland City Council that the stud fee for the services of the Zoo's Siamese cat is too cheap. The Association asked that the fee be raised from £1 to five

guineas, pointing out that if mating with the Zoo's cat was cheap, and often it would result in several generations of degenerate stock.

ARRESTING a man in Las Vegas, Nevada, for illegal possession of four boxes of morphine syringes, police were slightly stunned by his explanation: he was trying to sell the stuff to pay for his tuition through Bible school.

At Random

"Cats, my dear," said the spinster. "I hate the very sight of them. I had a sweet little canary, and some cat got that. I had a perfect parrot and some cat got that. I had an adorable fiancée and—Oh, don't mention cats to me!"—"Mis-a-Sip."

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- (3) Please leave all doors open as you come in; we believe in having as much fresh air as possible.
- (4) Kindly read any correspondence you see lying about, you then become more acquainted with our business.
- (5) Oblige us by sitting in our office chair, it is for the use of friends; we can manage on the floor.
- (6) Bang the door as hard as you can when leaving, we then know you have gone,

and it does the door good to be worked freely.

A married man is a fellow who's been penalized for holding.—Bob Hawk, radio programme.

It's supposed to have been a Swiss hotel-keeper who first developed the theory that you can tell a man's nationality by the way he goes off on a vacation. "The Frenchman," he said, "takes a holiday with his mistress; the Italian climbs into a railway carriage with his wife and 9 children, the Englishman packs off with his golf-clubs—but the American takes a vacation with somebody he's trying to sell something to." —Richard Joseph, "Men Only", (London).

The shortest distance between two dates is a good line.—Empire News.

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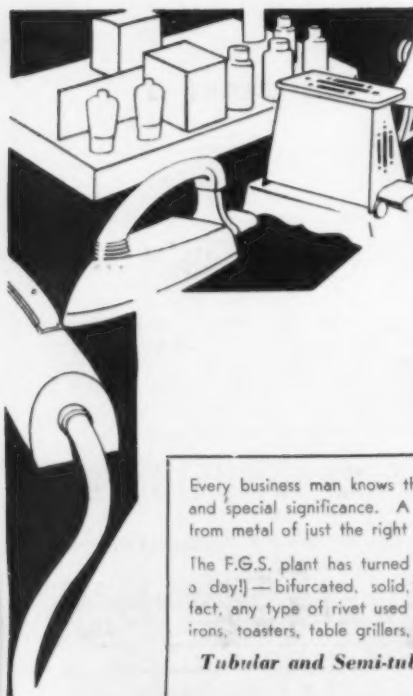
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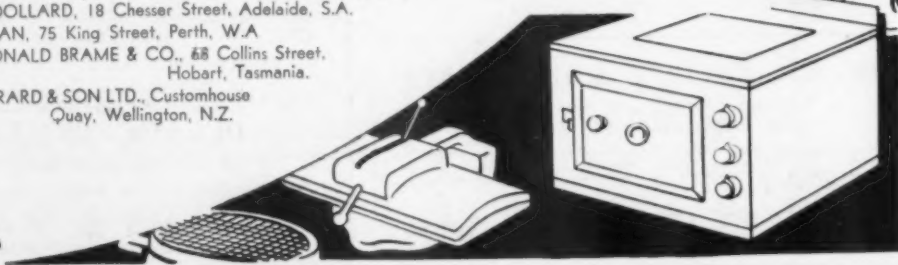
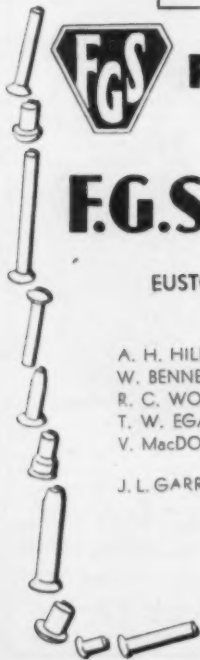
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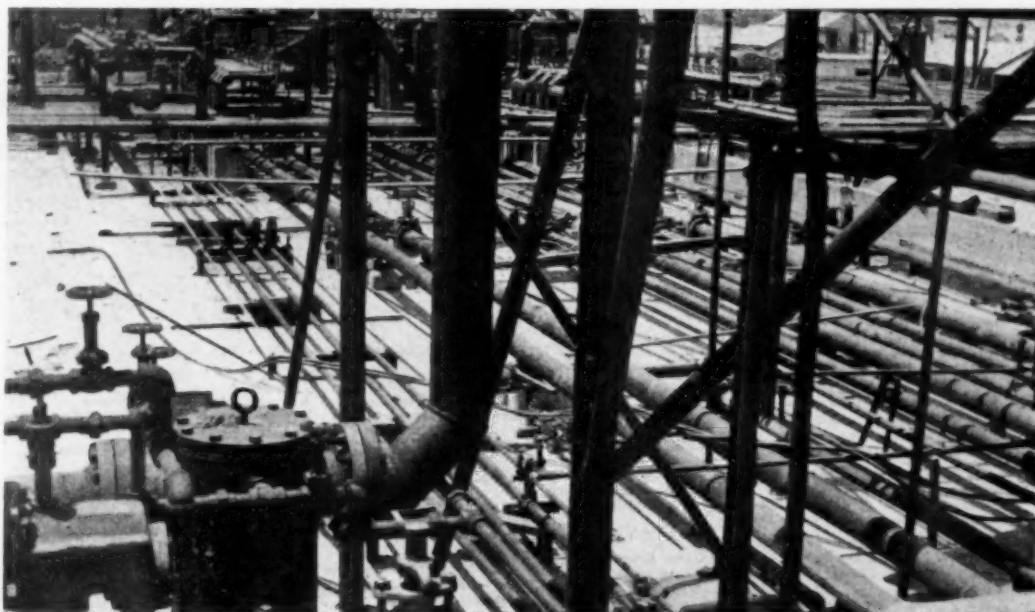
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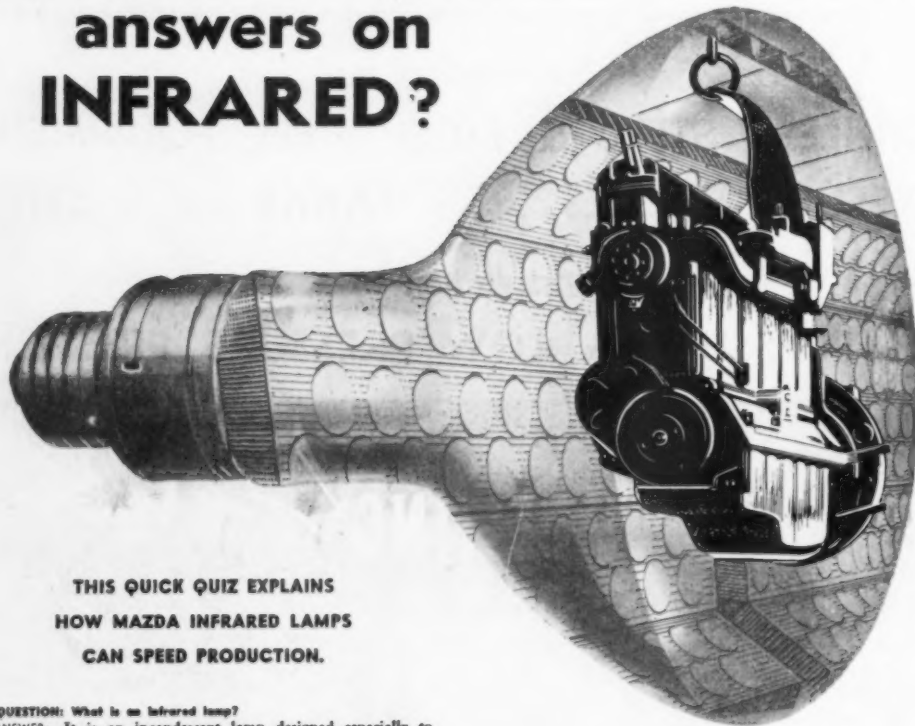
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QUESTION: How do infrared lamps work?

ANSWER: Properly installed Mazda infrared lamps produce heat quickly, cleanly, economically. Heat is generated within the material being processed—where it does the most good.

QUESTION: For what purposes are infrared lamps used successfully?

ANSWER: Drying paint and other finishes, preheating plastics, baking ceramic products, dehydrating raw materials, curing rubber sheets—to name just a few.

QUESTION: Is infrared equipment costly?

ANSWER: No. Fittings are easy to instal, Mazda infrared lamps are moderately priced, last a long time (average life 5,000 hours).

QUESTION: Can infrared lamp fittings be adapted to suit special needs?

ANSWER: Yes. Equipment is compact, movable—easily arranged to suit large or small production line operations. Mazda infrared lamp rating is 250 watt, 115/125 volt.

QUESTION: Can employees operate infrared equipment in comfort?

ANSWER: Yes. There's no excessive heat because radiation is focused directly on the work.

QUESTION: How does infrared effect product quality?

ANSWER: Controlled radiant energy makes possible more uniform processing. And infrared lamps facilitate visual detection of flaws.

QUESTION: Where can you get full information on infrared equipment?

ANSWER: Consult your nearest A.G.E. office.



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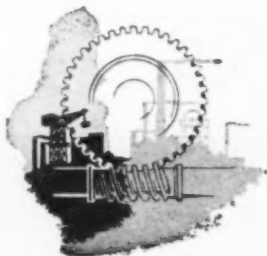
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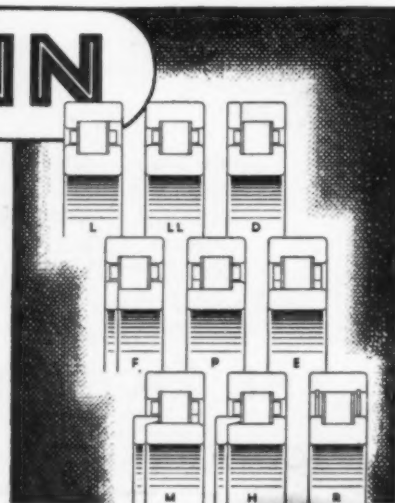


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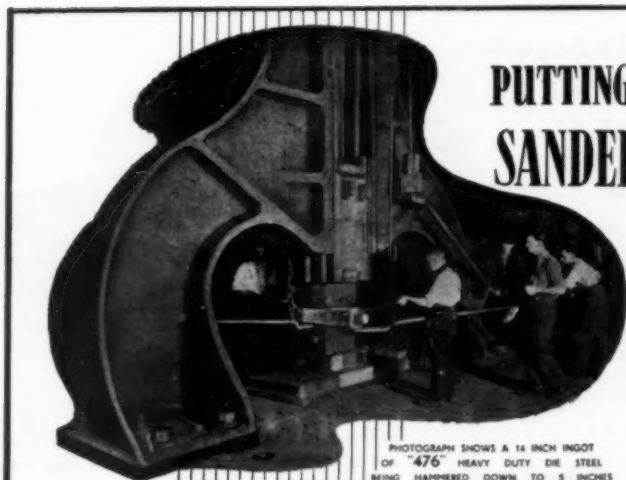
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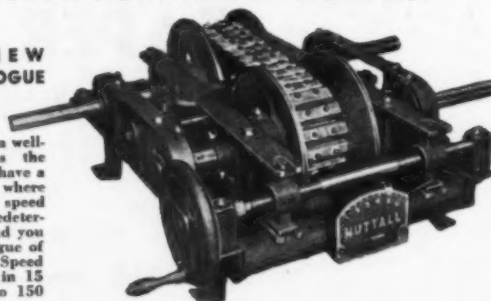
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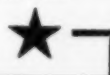
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Australia's National Manufacturers' Newspaper circulating in all States, New Zealand and Overseas. A weekly newspaper devoted to industrial efficiency and the manufacturing progress of Australia. Subscriptions within Australia and New Zealand (including Annual Number), £1/10/-; Great Britain and Possessions, £2; Foreign, £2/10/-. All subscriptions payable in advance. Microfilm subscription by arrangement.

PAGE FIFTEEN AUGUST 12, 1950.



International Trade, Tariffs and Exchange Rates Major Issues Under Discussion at Annual Meeting of N.S.W. Chamber of Manufactures

"The International Agreement on Trade and Tariffs which, fantastically enough, has been in operation for nearly three years though ratified only by Liberia, can completely stultify Australia's fiscal autonomy and sovereignty and do irreparable harm to Australia's manufacturing industries if it is allowed to continue. Under the Agreement, the most important items in the Tariff Schedule, irrespective of whether or not they are dutiable, have been bound against any alteration in favour of all member countries, and implicit in the Agreement is the ultimate extinction of reciprocal trade preferences among the British Empire countries."—Mr. R. H. Webster, in his Presidential Address at the recent Annual Meeting of the Chamber of Manufactures of New South Wales.

THE Presidential Address broke new ground in that instead of surveying the whole manufacturing scene, as is customary, it was confined to the consideration of the most vital issues to-day confronting the industrialists of this nation.

Overshadowing in importance all other questions is that of the renewal of the International Agreement on Trade and Tariffs which is to be decided at the International Conference to be held at Torquay, England, next month. The outcome of this conference is destined to have so fundamental a bearing on the future industrial development of this Commonwealth that it is impossible to understand the delay of the Federal Government in taking the Australian people into its confidence and acquainting them of the stand it intends to take at this momentous gathering.

As Mr. Webster pointed out, attempts are to be made to bind an additional one thousand items at the request of new member countries, at least two of which are behind the European "Iron Curtain." "In fact," he added, "practically every country in the world, with the present exception of Russia itself and Germany and Japan (and at least Germany and Japan will appear in the lists at Torquay) are hammering at the citadel of Australia's fiscal independence. All this can mean, if the tide is not stemmed, that the manufacturing industries of Australia will be submerged in a devastating economic flood and there will be no ark of safety for it."

He insisted, accordingly, that the wisest and safest step Australia can take is to withdraw from the Agreement at the termination of the provisional period, December 31st next. "If, however," he said, "the Commonwealth Government is unwilling to withdraw, then I express the

profound hope that it will unequivocally terminate the dangerous and negative understanding to bind tariff rates against all future alterations and to rescind entirely the undertaking to progressively reduce tariff rates and eliminate trade preferences." Australia, in other words, must refuse, and refuse flatly, to commit economic suicide. Indeed, to ask this nation to relinquish its deeply-entrenched policy of Protection to its industries—especially when these industries are working a longer week and paying wages higher than those being worked and paid abroad, notably Central European and Eastern countries—is tantamount to asking it to cut off its own right hand.

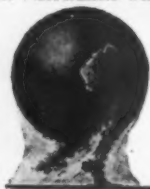
The Tariff Board, Australia's appointed instrument of tariff fixation, was discussed at some length by the President. Here, he touched on two major points. First, the supreme necessity of the Board keeping in mind that Protection is the fixed policy of this Commonwealth, as it has been from the day of its constitution. And second, the unfairness of the Australian manufacturer being disadvantaged before the Board as compared with his opposite number overseas. "I do not wish to be misunderstood about this matter," Mr. Webster said. "I am not suggesting that the Tariff Board should disregard the weight of evidence submitted to it, but I am suggesting that the Board is an Australian institution established to implement Australian national policy, and that all reference to the Board should be made with that fundamental principle in mind. Another matter in this connection to which I feel I must draw attention is that of procedure before the Board, and I would like to make it quite clear that I am making no personal adverse criticism of the personnel of the present Board. The matter to which I am now about to refer

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UMBER

For all Industries

has disturbed manufacturers in Australia for a very long time. I think I can best state the point I want to make in this way. Australian manufacturers, because they are 'on the spot,' so to say, with all their figures, costs, and samples, should not by reason of that fact be put in any worse position than their overseas competitor who is very rarely available in person, whose records are some thousands of miles away, who invariably appears before the Board through an agent, and is not available for cross-examination. I, personally, have known cases where even the names of overseas manufacturers were not available, and that alone to me as a representative of Australian manufacturers has an element of fantasy about it and might place the Australian manufacturer at a serious disadvantage." Everyone must admit the fairness of those contentions and agree that the points raised are worthy of earnest consideration by those in high places.

Turning to the Exchange question, Mr. Webster emphasised that currency appreciation could well arrest many present plans for the expansion

of existing industry and for the establishment of new enterprises. He reminded his audience that the present relationship between Australian and British currency has been in operation for upwards of twenty-five years and that any change at this date inevitably would have a disturbing and deleterious effect on Australian industry, particularly in view of the fact that Australian production costs are on the upward grade and that competition from overseas goods is rising at a rapidly increasing tempo. All of which points to the urgent necessity of Australia maintaining Exchange rates at their present level.

Each and all of the questions discussed so ably by Mr. Webster deeply affect the manufacturing industries of Australia, the industries which give diversified and remunerative employment to no less than 1,876,000 of her people.

It is well that they should be pondered seriously by industrialists. For on their shoulders rests the stern responsibility of conducting manufacturing enterprise in such manner as will best redound to the national good.

Pithy Jottings of Industry and Industrialists

INSTITUTION OF PRODUCTION ENGINEERS.

First meeting of the Adelaide branch of the Institution of Production Engineers was held in the Chamber of Manufactures Building on July 27.

Mr. C. A. Gladman, lecturer in production engineering at Sydney Technical College, spoke on "The Basic Features of Production Engineering."

Objects of the institution is to aid secondary industry by enlarging the knowledge and improving

the science and practice of production engineering.

FIRST AUSTRALIAN-BUILT MOTOR TRUCK.

To the International Harvester Company of Australia Ltd. belongs the honour of producing the first motor truck to be built within the Commonwealth. This left the production lines at the company's South Melbourne plant during the past week. The Minister for National Development, Mr. R. G. Casey, was present on the occasion. He pointed out that Australia's capacity to produce motor vehicles is of vital importance, adding: "This country will become an important Pacific industrial power if peace is maintained." The managing director of the company, Mr. W. W. Killough, detailing future plans said that the establishment of a £1,000,000 factory at Dandenong, Vic., will assist in alleviating the truck shortage.

NEW TARIFF BOARD INQUIRIES.

The Minister for Trade and Customs has referred 4 new matters to the Tariff Board for inquiry

and report in accordance with the Tariff Board Act, 1921-1950:

- (1) **Portable Electric Hand Tools.** What rates of duty should be imposed on drilling machines, polishing machines, grinding machines and sanding machines which are now charged with duty under Tariff Item 174 (K) (35); 2 (**Magnetos and Parts for Magnetos.** What rates of duty should be imposed on magnetos and parts for magnetos imported into the Commonwealth of Australia; (3) **Cameras.** What rates of duty should be imposed on cameras classifiable under Tariff Item 382 (A); and (4) **Pipe and Bolt Cutters.** What rates of duty should be imposed on pipe cutters and bolt cutters which are now charged with duty under Tariff Item 219 (B) or 449 (A) (1).

These matters will form the subjects of public inquiries at a later date.

BROSE VALVES AND ENGLISH OFFER.

Brose Valves Ltd., of Lidcombe, N.S.W., is considering proposals made by an English company. The company was established in Jan-

uary, 1946, to acquire from B. Rose Pty. Ltd., and H. E. Rose assets used to make high pressure valves.

NORTON TOOTILL APPOINTMENTS.

To cope with recent expansion and plans for future development, Norton, Tootill & Company Pty. Ltd. have recently made a number

"MANUFACTURER" 1950 ANNUALS

EXTRA COPIES AVAILABLE

"The Manufacturer" Annual (1950) is being acclaimed as a notable contribution to Australian industrial journalism. Many leading organisations have ordered extra copies for distribution among their business connections overseas.

Additional "Manufacturer" Annuals, including a number of copies specially bound in a heavy, durable cover are still available, but application for them should be made without delay to avoid disappointment.

TECHNICAL SALES

Representative Wanted

Qualified or partly qualified engineering student with sales ability required by Victorian Branch. Age 20-30 years. Good opportunities for advancement. Apply in writing, stating qualifications and enclosing copy references. Strictest confidence observed.

BRITISH TUBE MILLS (AUST.) PTY. LTD.

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of new executive appointments to their Head Office staff at Sydney.

Mr. John Guilfoyle becomes Manager of the Mechanical Engineering and Maintenance Division and brings to the Company the benefit of a wide experience in mechanical design and engineering. He was 11 years with Colonial Sugar Refining Co., initially at Childers, Queensland, and later at Head Office, Sydney, and was engaged chiefly on new plant construction in Queensland and the Pacific Islands.

On leaving Colonial Sugar Refining, Mr. Guilfoyle joined Australian Iron & Steel Ltd., working on structural and mechanical design at Sydney and Port Kembla. For the past ten years he has been with Gibson Battle & Co. Ltd., both at Alexandria and at Head Office.

Mr. Max Turner, A.S.T.C., will be engaged principally on work in connection with Concrete Plants, Asphalt Plants, Quarrying and Earthmoving Equipment, in collaboration with Mr. D. H. Collins, Manager of the Company's Civil Engineering Division.

Mr. Turner began his career on the Design Engineering staff of Colonial Sugar Refining Co., Pyrmont, and later at Head Office. He joined the firm of Taubmans Limited and, as Design Engineer, assisted in the installation of that Company's new Chemical Plant at Villawood. For the past three years Mr. Turner has been Technical Representative with Gibson Battle & Co. Ltd., Sydney.

NEW CLAY PRODUCTS ASSOCIATION.

A new association, the Clay Products Manufacturers' Association, was recently formed as a section of the South Australian Chamber of Manufactures. Officers are Messrs. T. Hallett (T. Hallett & Sons Ltd.), chairman, and R. A. Watkins (Adelaide Potteries Ltd.), deputy chairman.

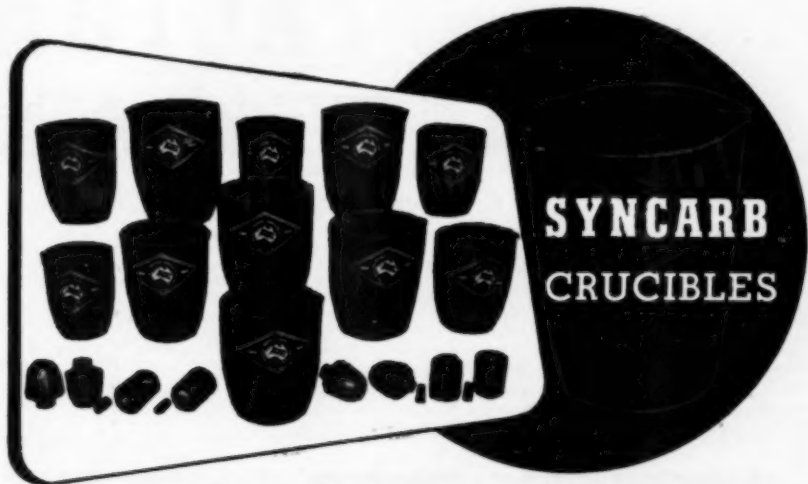
The association was formed principally with a view to becoming a member of the Australian Clay Products Association, a very active Federal body. In addition, the association will deal with local problems.

CONFECTIONERS' ASSOCIATION PRESIDENT.

Mr. Norman N. Robertson, chairman and managing director of MacRobertson (Aust.) Ltd., has been elected president of the Commonwealth Chocolate and Confectionery Manufacturers Association.

He succeeds Mr. R. C. Williamson, general manager of James Stedman Hendersons' Sweets Ltd. Other office-bearers are:—H. H. G. Hunt, managing director of Griffiths Sweets Pty. Ltd., vice-president; Mr. J. A. Shield, director; Wm. Arnott Morrow Pty. Ltd., Qld., vice-president; Mr. L. A. L. Barr, managing director of A. W. Allen Ltd., honorary treasurer.

Mr. R. Kirk, general manager Rowntree & Co. (Australia) Pty. Ltd., is acting honorary treasurer.



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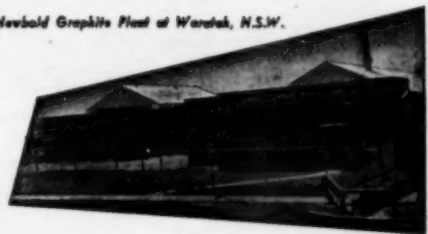
Silicon Carbide Mullies, Fire-clay Mullies, Crucibles.

Syncarb graphite crucibles are bonded entirely by carbon residues and offer, as a result, a number of cost-saving and operating advantages over conventional-type crucibles, as, for instance, lack of any necessity for annealing before being put into service.

Other advantages of Syncarb crucibles include—higher refractory characteristics, making for longer life at higher temperatures . . . self-glazing properties, preventing oxidation . . . higher thermal conductivity, making for faster melting.

Cost-minded foundrymen, looking for ways to save fuel, save on crucibles and increase metal pourings, will investigate Newbold Syncarb—the improved graphite carbon-bonded crucible that will not spall, scalp or crack.

★ Newbold Graphite Plant at Waratah, N.S.W.



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Our editorial representative in each State makes regular calls on manufacturers, but if YOU wish to see some particular phase of your business given publicity, communicate immediately with the Editor, and he will arrange for a representative to call.



Around & About the FACTORY

A digest of new factory and plant construction, additions, alterations and improvements, and operating news of Australian industry.

Numbering of Metal Components Inexpensive Hand Operated Percussion Press

With increasing mechanisation in industry and the growing complexity of machines and machine tools employed in manufacturing, the trend of recent years has been towards providing foolproof component, batch, or model identification by means of letters or numbers.

By stamping nameplates or components with identifying letters and consecutive or batch serial

operated Percussion Press must be of interest to manufacturers whose output comes within either of these categories.

Known as the No. 48 Percussion Press, this machine is particularly suited for use by female operators. Because of its light weight, 20 lbs., it may also be taken from department to department to be used in large or small production runs on nameplates or small component

ximately 60 lbs., the machine provides adjustments for varying the depth of the impression. The work base is machined flat and the work can either rest on the base, or where necessary on a vee block, specially designed holder, jig or bolster.

In addition to the automatic numbering head which is available for this machine, ordinary lettering dies with type holder, loose type,

etc., may be obtained. With suitably designed tools the press may also be used for various light work such as riveting.

Full particulars of this press, or of the many larger presses available for use with their wide range of consecutive or repeating numbering heads, are available on application to J. M. Hardie & Co., 434 Little Bourke Street, Melbourne, C.I.



Hand Operated Percussion Press for Numbering Metal Components.

numbers, an efficient check back has been made possible when complaints are received after a machine or component has passed out of the hands of the maker. In addition, replacements for wearing parts may be ordered by users without reference to catalogues and with no possibility of error.

With very small batches of components, hand punches are sometimes used for marking, but this system can hardly be recommended where neatness or accuracy is required. Where large numbers of parts are to be marked, however, the use of a press is mandatory and the announcement by J. M. Hardie & Co., 434 Little Bourke Street, Melbourne, of an inexpensive hand

parts of plastics, brass, aluminium or mild steel.

As no skill is needed in the operation of the machine, unskilled workers can be taught to produce neat and accurate results in a few minutes.

Absolute uniformity is ensured by the simple action of the press by which the numbering head is pressed on to the material or nameplate required to be marked, when an additional pull on the handle releases the internal percussion action. In this way even depth of the impression is obtained no matter how much the thickness of the material or the pressure exerted by the operator may vary.

With a maximum blow of approx-

"Mazda" Infra-red Lamps

Manufactured by Australian General Electric Pty. Ltd.

The entry into industry of the infra-red lamp has been responsible for a marked uplift in the quality of a wide range of goods. This is by reason of its ensuring a high measure of uniformity in processing, and because its use facilitates the visual detection of flaws.

It is of fundamental importance to the manufacturing industries of Australia, therefore, that these lamps, among the latest of Science's contributions to industrial progress, are being made locally.

As is fitting, their production is being undertaken by one of the nation's leading manufacturers of electrical equipment of all types—the Australian General Electric Pty. Ltd., which operates ultra-modern plants at Auburn, New South Wales, and at Richmond, Victoria.

The infra-red lamp is an incandescent lamp specifically designed to produce controlled radiant energy for such varying types of industrial processes as drying, heating, curing, baking, and dehydrating.

The A.G.E.'s product, the "Mazda" infra-red lamp, produces heat quickly, cleanly, and economically. The heat is generated, moreover, where it is capable of doing the most good—within the material being processed. It is, accordingly, admirably adapted to the drying of paint and other surface finishes; to the preheating of plastics; to the baking of ceramic products; to the dehydration of raw materials; to the curing of rubber sheets—to name at random a few of its major uses.

Of special significance are the facts that "Mazda" infra-red lamps

are easy to instal; that they are moderate in price; and that they have a long life, averaging 5,000 hours. In addition, the equipment is compact and readily movable, and can be installed to suit large or small production line operations. "Mazda" infra-red lamp rating is 250 watt, 115/125 volt.

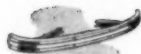
It must be pointed out, too, that its use involves neither danger nor discomfort to the operators, due to the fact that there is no excessive heat, radiation being focused directly on to the work.

This infra-red lamp is a worthy addition to the already vast range of A.G.E. products, which range includes such items as power transformers for generating and distributing stations; current and potential transformers for metering and protection; high and low voltage oil circuit breakers; enclosed and open type switchboards; and outdoor type switchgear. Add to this, industrial motors from ½ to 500 h.p., mill motors, motor control and electric shovel equipment, electronic controls, fluorescent lighting auxiliaries, and the wide range of "Hotpoint" articles and it becomes abundantly evident that the products of Australian General Electric Pty. Ltd. are as diverse and as important as are the uses and applications of the great force of electricity itself.

SPECIAL NOTICE TO READERS

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processing plant, drawing office and assem-
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Automatic Direct Switching Starter

Wide Application in Industry

Sold by Warburton, Franki Ltd., the Z.T.S. Automatic Direct Switching Starter manufactured by Brooks Motors Ltd., of Huddersfield, England, is finding wide application in industry. Designed to give reliable service under the most exacting conditions, this starter is conservatively rated so that safe operation and long life are assured.

The panel, which is of moulded plastic construction, is resiliently mounted in the case so that the performance of the starter is unaffected by vibration. The hinged case is die-cast and the contactor arm is of moulded plastic. A cavity mounting model is also available for machine tools.

Mechanical specifications are as follows: totally enclosed wall mounting, cable entries have clearance holes for 1 in. conduit, terminals easily accessible, all metal parts plated, push-buttons built in case, mushroom head STOP button to ensure speedy selection in emergency, auxiliary contacts fitted with silver points, visible ON-OFF indicator, coil is pressure impregnated and baked, contacts and coil easily renewable, thermal heater coils interchangeable for various H.P. ratings, external hand reset of overloads conveniently placed on side of case.

Electrical specifications are: inherent low voltage protection to trip off starter in case of failure of supply; overload protection on all phases by indirectly heated thermal trips with inherent time lag which incorporates delay for

starting; triple pole magnetically operated contactor suitable for use up to 660 volts.

The maximum rating for the starter for various voltages (three phase) are: 660 volts-11.5 amps, 550-14, 500-15, 440-17.5, 400-19, 350-22, twelve and a half horsepower; 200/220 volts-24 amps, seven and a half horsepower.

The maximum rating of the starter, single phase, is: 500 volts-13 amps, 400 volts-19 amps, six horsepower; 200/250 volts-24 amps, four horsepower; 100/125 volts-24 amps, one and a half horsepower.

Thermal overloads comply with international specifications and are calibrated to trip on 400 per cent. overload in 10/25 seconds; 50 per cent. overload in one to two minutes; 20 per cent. overload in 30 to 60 minutes. The starter will withstand a 5 per cent. continuous overload without tripping.

The starter, which is rated for "Frequent Duty", i.e., 40 starts per hour, may be operated by local or remote control by push-buttons at any number of points by limit, float, pressure, or other master devices.

Extras include an ammeter, non-standard coils for other than 50 cycles supply, and silver faced contacts for special duties (these are fitted as standard on models above 13.6 amps). Single and multiple push-buttons are also available in a variety of wording such as "start", "stop", "inch", etc.

Further particulars will be gladly supplied by Warburton, Franki Ltd.

"Palec" Electrical and Radio Test Equipment

Products of Paton Electrical Pty. Ltd.

The important tasks entrusted to all classes of electrical and radio apparatus demand that under all circumstances and under all conditions, performance shall be at a maximum peak of efficiency. This high measure of efficiency, in turn, presupposes the availability of accurate testing instruments, mechanisms which record with almost infinite precision the slightest departure from maximum operating efficiency.

Throughout a sixteen-year period, the plant of Paton Electrical Pty. Ltd., 90 Victoria Street, Ashfield, New South Wales, has been engaged in the production of a wide range of specialty electrical and radio apparatus, apparatus characterised by unfailing accuracy and technical excellence in every detail.

These instruments, which are marketed under the brand of "Palec", function with a high degree of dependability under all operating conditions. This is because their makers at the factory at Ashfield are backed by a

modern research laboratory in which are tested, not only all the raw materials which enter into production, but also each instrument at different stages of its manufacture. This system of scientific testing and inspecting ensures a product high in quality, high in performance, and high in reliability.

Take, for instance, the "Palec" A.C. power analyser, Model PA. Claiming to be Australia's first dynamometer multi-meter for electrical service, maintenance and testing, it comes forward in the following ranges:

Volts.	Amperes.	Watts.
A.C.-D.C.	A.C.	A.C.
0 - 125	0 - 1	0 - 10,000
0 - 250	0 - 5	0 - 9 ranges
		of watts.
0 - 500	0 - 20	3 for each
		voltage range.

Power	Watts	Rotary
factor		switch
	Volt Amperes	
selection	without	disconnecting
	circuit.	
Power consumption:	Negligible.	

Light Metal Stampings



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240 VOLTS 3.0 AMPS

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H 810

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H 811

2 PLATE
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ALSO H 812

3 PLATE
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J.J. HOELLE & CO.

47 ALMA ST., DARLINGTON, N.S.W. TEL: MX1561-3.

Of special importance is the fact that the "Palec" power analyser incorporates a true dynamometer movement of the nickel-iron cored type. Neither rectifiers nor non-linear resistances are included, nor is it necessary to compensate for line voltage in watt meter readings. The effects of wave form, power factor, voltage, current and frequency variations are negligible.

This power analyser has a wide range of application, including industrial maintenance, production testing, and laboratory work. It is particularly suitable for testing and servicing refrigerators and other motorised appliances. D.C. as well as A.C. voltage may be measured.

Another "Palec" specialty instrument is their M.30 multimeter. This new 30-range multi-meter which, by the way, supersedes their erstwhile famous model MCA, is indispensable to modern radio and electrical technique. It is available in several ranges.

Other items in the "Palec" range include pyrometers; bi-metallic thermometers; photographic exposure meters; portable and studio electronic flash units; industrial volt. ammeters; moving coil, moving iron, and R.F. panel instruments; temperature indicators for electric ovens; and dual range photo exposure meters.

The high standard of workmanship characterising all "Palec" products which, obviously, is reflected in their high

operating efficiency, is a particularly striking example of the new high levels of quality being attained by Australian manufacturers in this vitally important field.

SOLVING PROBLEMS OF FULL EMPLOYMENT.

The Institute of Industrial Management, Melbourne, is organising a one day Top Management Conference at the University of Melbourne on August 29th, when discussion will centre on "Solving the Problems of Full Employment." Mr. David E. Lewis, A.C.A.A., F.C.I.S., business manager, Daylesford Centenary Woolen and Worsted Mills Pty. Ltd., will discuss "Management's Problems in a Situation of Full Employment"; Mr. K. F. Walker, M.A., Controller Personnel Practice Branch, Department of Labour and National Service, will deal with "A Psychological Analysis of Management's and Employees' Problems"; and Mr. M. C. Jordan, Assistant Secretary, Melbourne Trades Hall Council, will speak on "The Employee's Viewpoint in a Situation of Full Employment."

The Institute is particularly anxious that executives should inform the conference as to how they have tackled their individual employment problems, indicating in which directions their experiences may be helpful to others.

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Development and Production of New Lines



SOME OF MANY LINES MANUFACTURED:

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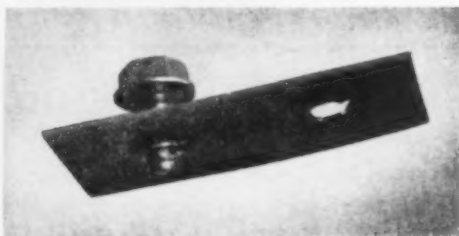
YOU WANT TO KNOW . . . and the editors will gladly tell you . . . more about the inventions, materials, and processes mentioned on this page. Write to Box 1687, G.P.O., SYDNEY, enclosing a stamped, self-addressed envelope.

Automatic Nut-Making Process Simplifies Assembly

In a new patented process for punching a specially shaped nut in sheet metal up to 1 in. thick, all of the usual sheet metals can be used, including aluminium, mild steel, stainless steel, or brass.

In practice, a production department can provide any number

In operation, special punches and dies (supplied by the company) pierce the metal and form it to a helical shape conforming to the pitch of the screw thread. The shaped nut gives a full 360 deg. grip on the thread, and makes a much stronger than



Hole is punched and fastener formed in one operation. Notice how the formed "nut" supports one complete thread for a full 360 degrees. These fasteners can be punched in any sheet metal, including aluminium, spring steel, mild steel, and brass or bronze. A number of these fasteners are usually punched at once.

of integral fasteners by a simple stamping operation. This means that separate fasteners need not be procured, stored, handled or applied.

usual fastener. Any number of separate "nuts" can be stamped in the same operation. Since holes usually have to be stamped anyway, regardless which fastener

is used, there is no duplication of operations.

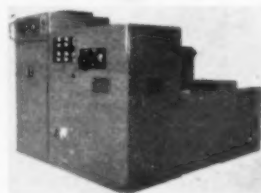
In applications where the product will be enamelled, standard tools are used in the hydraulic press. The tools compensate for enamel build-up and the impressions do not fill with enamel or require wiping, nor do they cause crazing or chipping when screws are tightened into them.

The versatility of this fastening method will appeal particularly to design engineers. There is a choice of stamping the thread grip directly into the structure or into structural parts; or using separate fasteners depending on the requirements of each fastening job.

This process is handled on a licence basis, with the company furnishing the special tools that can be adapted to any press production line. Engineering service is provided to determine whether the process is applicable to the product. For applications where the fastener must "float" slightly to make up for unavoidable misalignment, a special fastener, that clips to the assembly, can be supplied. Having already been adopted by the automotive, refrigeration and radio industries, the method will now attract the attention and interest of design engineers in other industries using sheet metal in the fabrication of their product. [2502].

Ring Gears Handled Automatically in H.F. Unit

An induction hardening equipment for the heat treatment of starter ring gears has recently been developed. Feature of this equipment is that it will harden the teeth of three different sizes of gears varying between 10.2 in.



General view of the unit shows the loading station, at centre right, the control handwheel and lever, and the process timers. After heating, the gear is dropped into a water quench and rests on a wire mesh conveyor which carries it to the ejection bay at the right of the unit.

dia. by 0.312 in. thick to 16.2 in. dia. by 0.5 in. thick. The depth of hardening is approximately 0.1 in. below the roots and can be controlled within limits.

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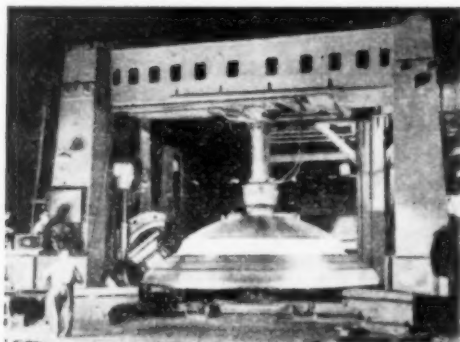
The other requirements of the specification were that the change-over from one size of ring to another could be readily effected, and that coil changing should be carried out automatically within the machine, so that the equipment was capable of being operated by unskilled labour. The rate of production had to cover a total output of 900 small, 240 medium and 220 large rings in 18 hours, and the rings had to be removed from the quench bath at a temperature of approximately 200 deg. C. to provide stress relief in the material.

Illustrations show the equipment that was finally developed. The rings are placed, one at a time, in the circular-loading frame at the loading station. The frame can be easily changed to suit the size of ring. After

serted at the operator's convenience.

At the Curie point, the steel at the surface of the gear ring becomes non-magnetic, resulting in a "skin effect," where the lower impedance of the non-magnetic regions causes an increase in temperature at the expense of the magnetic regions. To provide for re-matching, a power factor correction condenser is automatically brought into the circuit.

On the completion of the heating cycle, the spring-loaded arms release the ring, which drops into the quench, and rests on a wire mesh conveyor, which removes it from the water and delivers it to the ejection bay. Heat exchanger coils are incorporated in the tank to limit the bath temperature. The speed of the conveyor is regulated so that the ring leaves



Spins the biggest heads: This new flanging machine can spin a sheet of metal into a flanged head for an industrial tank, boiler, or pressure vessel that has a diameter up to twenty feet, six inches. This is an overseas company's latest advance in a field it pioneered sixty-five years ago by making heads up to seven feet in diameter. [2527].

the lid above the locating frame is closed, the cycle is completely automatic.

The ring is supported by three adjustable arms, which lower it on to a hydraulically operated carriage. This carriage conveys the ring horizontally to a position immediately below the heating coils. There are three coils, supported one above the other.

The ring is then engaged by three spring-loaded arms which bear against the inside of the ring. These arms are mechanically operated and are attached to the end of a vertical shaft, which can be moved up or down under the action of an hydraulic mechanism. The ring is automatically lifted into the plane of the correct size of heating coil, and the R.F. power automatically switched on. In the illustration a gear ring can be seen in the plane of the intermediate coil, with the teeth at red heat.

When the ring is lifted off the carriage this returns to the loading station, where the lid opens ready for the next ring to be in-

serted at the operator's convenience. The necessary turbulence is created by the passage of the conveyor belt through the quench.

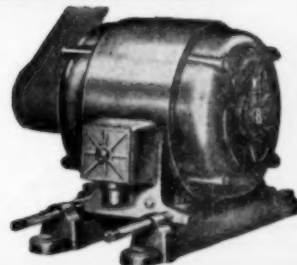
The H.F. power is supplied by a 25/30 kW. type IH. 5 generator, at a frequency of approximately 400 kc. The gear rings are made from 0.4 C. steel, and the largest ring has a total surface area of about 18 sq. in.

Changing production from one size of ring to another is effected by a lever and hand-wheel on the front of the unit. The lever is put in the "reset" position, and the correct locating frame placed in the loading station. Main control wheel is then turned to appropriate position for "small," "medium," or "large" rings and the lever put in the "ready" position. The conveyor speed is then adjusted to the correct setting by a knob provided, in conjunction with a neon indicator lamp. Total time needed for these operations is of the order of 30 secs.

Circuit preselection and process timing are all automatic and are

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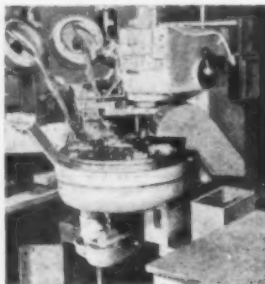
controlled by an interlocking switch circuit operated by contacts on the locating frame and on the control wheel. H.F. power cannot be applied until the controls are properly matched and the correct size of ring inserted. When the "on" button is pressed a blue lamp lights up indicating

that the setting is correct and the hydraulic system is ready for operation.

The hydraulic pumps and valves used in this equipment are of the Vickers-Detroit type. Total floor area, including the self-contained water-cooling units, is 18 ft. by 8 ft. [2538].

Automatic Riveting of Small Parts

For economical riveting of small silver contacts to spring steel and bronze arms, special dial fixtures and ram tools have been designed for use with a standard oil-hydraulic Multipress with indexing table. With this automatic hydraulic equipment, more than 900 contacts can be produced per hour.



Electrical contacts are automatically riveted at the rate of over 900 per hour on a press equipped with hopper feeds and an indexing table.

While the operation itself is relatively simple, highly accurate control of the ram pressure is of great importance. The number of silver contacts to be riveted to each contact arm determines the number of hoppers required to feed the rivets. Two hoppers are employed for the set-up shown.

Automatic indexing of the table, coupled with the automatic hopper feeds, reduces the cycle time considerably. The operator is only required to load the contact arms into fixtures at the stations seen at the front of the indexing table, and unskilled workers can produce high-quality contacts.

The loaded fixtures automatically index in a clockwise direction beneath the hopper feeds. Every downward stroke of the press ram opens the feeding jaws on each hopper slide, permitting the contacts to drop into the desired positions on the arms. The fixtures are then moved automatically to the pressing station, for the riveting operation. Finally, the completed contact arm is indexed to the ejection station seen at the extreme right. [2539].

Improved Polishing Aluminas

Metallurgical research will benefit from a recent advance in practical metallurgy. Microscopic investigation of metals yields research workers much valuable information, provided that the specimen's surface is brilliant but scratch-free. The polishing employed to give brilliance depends on the use of cloths carrying powders, such as the oxides of chromium, iron, magnesium, tin and aluminium; in polishing, these powders may also scratch.

Fundamental research has established that scratches are caused by needle-shaped particles in the powder, or by particles appreciably larger than the average. Speed of polishing is influenced by the hardness of each grain, and the resistance to blunting of its cutting edges. These factors depend on accurate control of various manufacturing processes.

A practical form to this theoretical knowledge has been given by a British firm. After four years' investigation, in conjunction with various official and industrial research organisations they have produced three improved powders, all based on alumina, the oxide of aluminium.

(Turn to page 26.)

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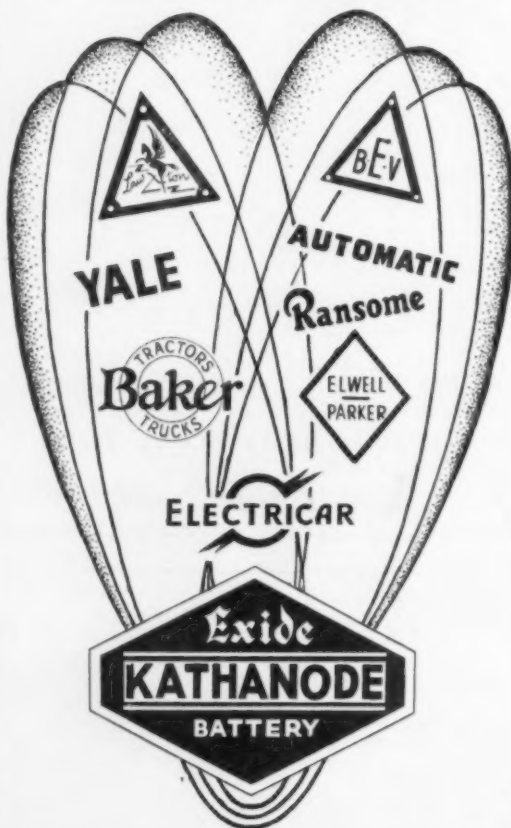
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(Continued from page 24)

One of them, known as Gamma, is specially designed as an all-purpose material. Under the microscope, it appears to have a porous, plate-like structure, but slight pressure on the polishing cloth reduces it to roughly cubical particles 1-1.5 microns in size, themselves probably aggregates of infinitely smaller crystals. Gamma

powder's characteristics are particularly suited for polishing all non-ferrous materials, and for imparting a high-grade finish to steel and cast iron.

The two other powders are designed particularly for either fast- or slow-cut polishing of iron and steel products. To this end, the proportion of coarse and fine grains present, is carefully adjusted. [2523].

Column Mounted Planisher Has Sensitive Control

The column-mounted planisher, here illustrated, has been added to a range of pneumatic equipment made in England. It is applicable to a wide range of planishing and weld beating operations in the manufacture and repair of sheet metal parts, the

valve, and the height of the top arm is adjustable so that bulky workpieces can be handled. [2506].

Saw Blade That Cuts Costs

A basically new saw blade offers woodworking and other plants doing circular sawing greatly reduced output.

The saw blade differs from conventional circular blades: it has only a limited number (usually eight) of teeth put at wide intervals around the periphery of the blade. After testing in some of the larger wood-working plants, the manufacturer claims these results:

1. Elimination of the danger of kickback injuries. Since the blade travels in the same direction as the wood is fed, there is no tendency for it to throw smaller pieces into the air.

2. Minimizes effect of accidental cuts on users' hands. There is no tendency to draw hands into gap between blade and table.

3. Longer life and less sharpening. Since the edge of the blade is nearly solid, there's more rigidity, and dulling side-friction on blade is reduced. [2528].



New Column-type Planisher.

pressure-reducing valve fitted at the top of the column providing a ready means of controlling the speed and power of the blow.

The operating cylinder fitted has a bore of 1 1/2 in. and a stroke of 5 in., and incorporates a piston-type valve. Sensitive control of the planishing tool is pro-

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An ironworker stands behind a steel guard as molten metal flows from his blast furnace in a United Kingdom iron foundry. The self-loading furnace has been filled with layers of coke, limestone and iron ore. The burning coke melts the metal from the ore so that it flows down between the limestone lumps and into a vat at the bottom of the furnace.



Using remote control, workers pour molten iron into a mould for casting. The picture was taken at an iron foundry in Britain.

Modern Iron Foundries

Survey Reveals Remarkable Development in Recent Years

Since World War II there has been a progressive expansion in the output of 'Britain's iron founding industry, which in 1949 produced 3.38 million tons of finished castings. This record tonnage was achieved in spite of a slight industrial recession during the early part of the year and compares with 3.28 million tons in 1948, 2.54 million tons in 1946, and an estimated 2.77 million tons in 1940.

This expansion of production has been paralleled by technical progress and by a big programme of foundry modernisation. From October 1, 1946, to December 31, 1949, Britain's Iron and Steel Board approved a total expenditure of approximately £8,000,000 on improvement and modernisation schemes.

A. Graham Thomson, formerly editor of the "Engineer and Foundryman", published in the Union of South Africa and who is now in Britain, reports that machine moulding expanded rapidly during the war and it is being increasingly applied to the production of general engineering castings in grey iron. Designs have been greatly improved and United Kingdom manufacturers have lately developed moulding machines which are fully automatic. There is a general realisation that only in exceptional cases is complete mechanisation justified. Most foundries limit the use of mechanical aids to sand preparation, box handling and knock-out. These methods, coupled with improved laboratory control, have transformed casting into a more exact science, resulting in products of greater uniformity and better finish. Within the laboratory, empirical methods of control are coming into greater use and more producers are adopting wedge tests as well as tests for chilling, graphitisation and so on.

UNCONVENTIONAL DESIGN.
In the field of cupola operation an outstanding achievement has been the development of a cupola

of unconventional design and shape which offers outstanding economies, important features being the use of water-cooled panels in the

melting zone and the use of a basic lining. Many firms are of opinion that during the next decade basic linings will come into increasing favour, due to the advent of spheroidal-graphite iron, since they will assist in obtaining the very low sulphur and high carbon ash contents which are desirable. The hot blast cupola is making only slow headway in Britain, possibly because melting requirements are seldom large enough to make it fully attractive. At least one firm has made a start with oxygen enrichment, but the scope for development in this direction seems at present to be limited by the general absence of plentiful supplies of cheap oxygen. Wherever justified by the size of the cupola, there has been a considerable increase in mechanical methods of charging. Greater attention is also being devoted to the correct preparation of charges.

The process of inoculation, whereby a potent graphitiser, such as ferro-silicon or calcium silicide, is added to the molten iron shortly before pouring, is being much more extensively employed.

(Turn to page 40.)



Ladle being filled with molten iron from a cupola furnace in a United Kingdom foundry.

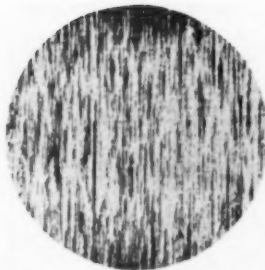


Fig. 1. Hardened Steel. Fine Ground.

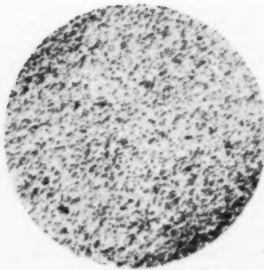


Fig. 2. Hardened Steel. Lapped.

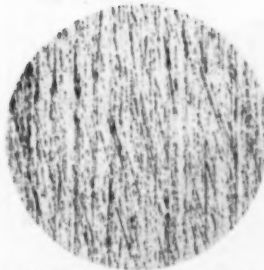


Fig. 3. Hardened Steel. Honed.

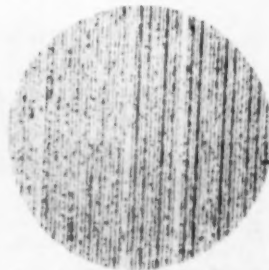


Fig. 4. Aluminium. Diamond Turned.

Striking comparison between surfaces produced by different machining processes.

The "MSE" Surface Comparator

Direct Optical Comparison

Wherever an accurate dimension must be held, or wherever wear is required to be reduced to an absolute minimum, the importance of Surface Finish Control as an essential part of engineering inspection is now generally recognised.

Just as hardness has been reduced by standardisation of testing equipment to a simply expressed and positively comparable Rockwell or Brinell index number, and machinability has been resolved also by the MSE-Schlesinger Machineability Tester to a comparable index figure, so Surface Finishes on such things as bearings, sliding glands, or seats for moving parts of any kind, can be tabulated to a scale of Surface Finish Standards expressed as a series of average index numbers or symbols on a drawing.

THE "MSE" Surface Finish Comparator offers to both workshops and inspection departments a reliable, simple, and inexpensive method for the qualitative inspection of surface finish as a normal routine.

Intended essentially for practical applications, the "MSE" Comparator has not been designed for the quantitative measurement of surface profiles or average values, the measurement of which requires considerable training and skill on the part of the operator, but rather for the practical application of surface finish control to the production of commercial components where it is generally satisfactory to determine by comparison with an approved master whether or not the surface produced is within the limits of allowable roughness specified on the drawing.

The "MSE" Surface Finish Comparator comprises two microscopes which are combined in such a manner that the two fields of view are joined together and the magnified images of the master and workpiece appear in the eyepiece opposite each other. The dividing line between the two images is very fine and can be made to dis-



MSE Optical Surface Finish Comparator, with workpiece and master in position.

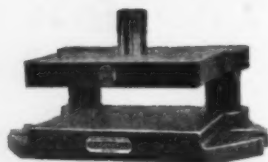
appear completely, permitting the closest possible comparison.

In this way the microscopic examination and comparison of surfaces under properly controlled lighting conditions discloses even small differences in their topographical structure. Applications have shown that operators not at all conversant with the manipulation of optical instruments attain, after very little practice with the "MSE" Comparator, an unfailing certainty in determining the surface finish of components.

Fine surfaces appearing almost identical to the naked eye may show under the comparator an entirely different structure which is particularly striking when comparing surfaces produced by different processes as shown by the accompanying illustrations.

The "MSE" Optical Surface Finish Comparator consists of a comparator head which incorporates the optical and illumination systems with their controls, and independent tables for the work to be inspected and the master for comparison. Provided with a dovetailed baseplate, it may be mounted on the well constructed base supplied or on special inspection fixtures made by customers to suit their own requirements.

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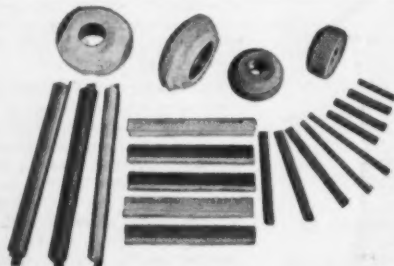
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Where surface finish must be controlled in regular mass production, individual masters should be provided identical in shape, size and material with the component to be checked. These masters are usually obtained by selecting from a batch a few representative samples known to be satisfactory, while for general work sets of surface finish standards are available which are indispensable as a reliable basis for inspection. These standards are as important for surface finish control as slip gauges are for dimensional control.

The set of "MSE" surface finish standards contains eight cylindrical steel pieces 3 in. long by 11 in. diameter machined in accordance with the scale of average index numbers to a surface finish of 1, 2, 4, 8, 16, 32, 63 and 125 micro-inches. For protection, each standard is provided with one round and one hexagonal plastic ring, the latter being engraved with the average index number.

Available with the optical surface finish comparator which is distributed in Australia by Thomas Optical & Scientific Co. Pty. Ltd., of 354 Lonsdale Street, Melbourne, C.I., these surface finish standards offer to the practical engineer a readily available means of standardising and controlling surface roughness either by means of the comparator or, for less critical results, by unaided sight and touch.

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(Turn to page 32.)

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- Operates from 2.5/6.3 volts A.C. or D.C. or from mains with transformer.
- Heats up from cold to ready-for-continuous use in only 6 seconds.
- Has an efficiency equal to that of irons rated up to 150 watts.
- Weighs only 3½ ounces and is 10 inches long.
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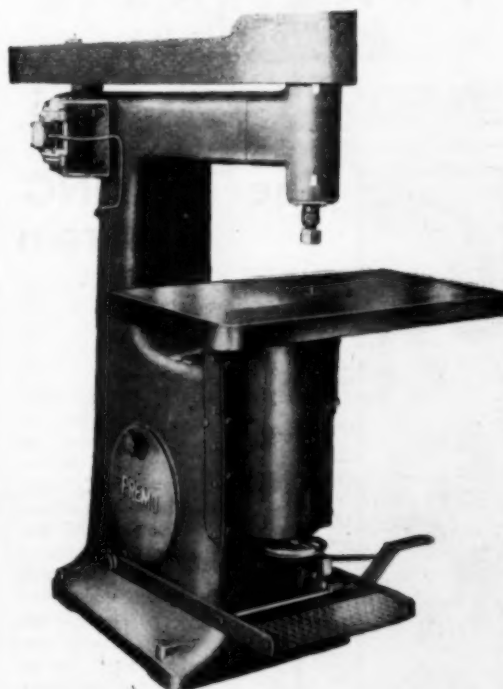
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(Continued from page 30.)

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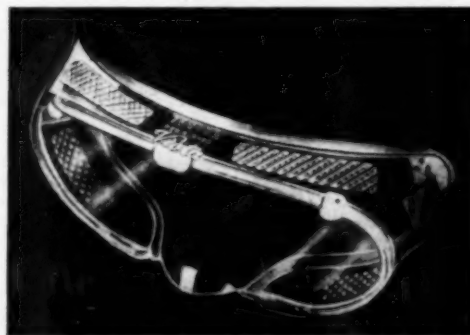
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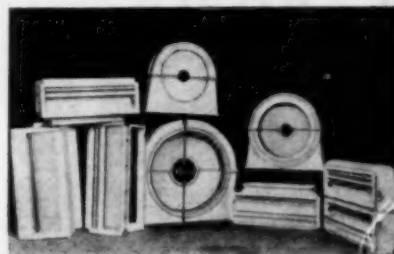
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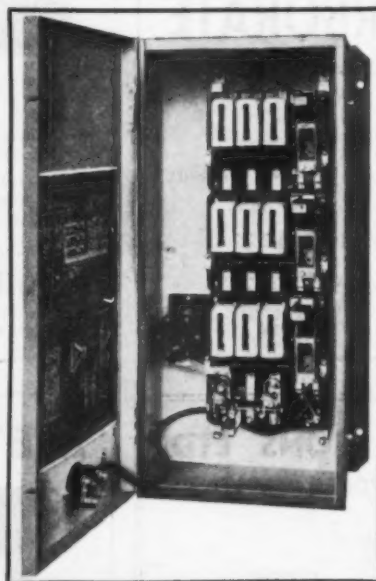


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(Continued from page 32.)

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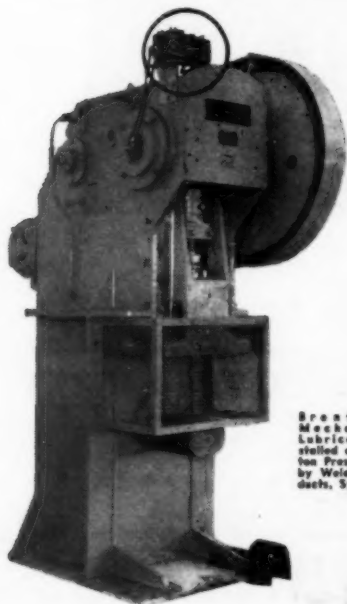
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This Inquiry Service is for the use of readers of "The Australasian Manufacturer" who wish to trace suppliers of Plant, Equipment and Materials, and for particulars of agencies offered. Address your inquiry to the Inquiry Department, and give the fullest possible particulars to enable us to put you in touch with the best sources of supply. **INCLUDE A STAMPED SELF-ADDRESSED ENVELOPE WITH YOUR INQUIRY.** It is essential that telephone inquiries be confirmed by letter. No charge is made for Inquiry Services, but normal advertising rates will be charged if agencies are sought by manufacturers' representatives or if goods are offered for sale. For the benefit of new subscribers, inquiries will be published in two or more consecutive issues.

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DEATH OF S.A. ENGINEER IN W.A. PLANE CRASH.

Mr. E. W. Forwood, who was fatally injured in the recent major air disaster in Western Australia—though he survived for a few days—had been associated for about 50 years with the engineering firm of Forwood Down and Co., which was founded by his father, the late W. W. Forwood. He was managing director of the firm and director of an associated company, Forwood, Down, W.A. Pty. Ltd.

Born at Mile End, Mr. Forwood entered the firm as an apprentice on leaving school.

During the first world war he served with the A.I.F. for 4½ years in motor transport units in Egypt and France.

He was noted for his generosity and philanthropy, and made many private gifts to people in need.

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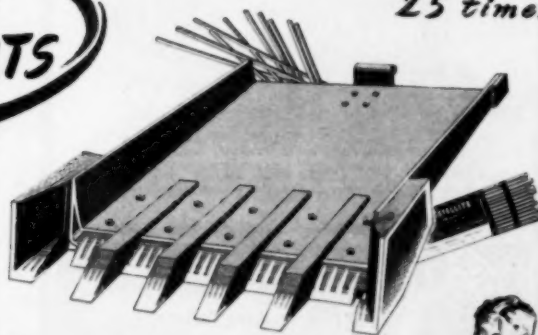
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Rayon Industry Protection

Full Assistance Recommended by the Tariff Board to be Applied in the Form of Duty

In August, 1948, the question of the present position and future prospects of the Australian artificial silk piecegoods weaving industry was referred to the Tariff Board for public inquiry and report. The Board was asked at the time, in the event that it considered the development of the industry on an economic and stable basis warranted the imposition of protective tariff duties, what rates of duties should be imposed.

The following statement, issued by the Department of Trade and Customs, mentions factors discussed at the public inquiry, and also the report of a special Departmental committee which was examined prior to the Tariff Board's report being considered by the Government.

THE public inquiry was held by the Board in Sydney and Melbourne on various dates during the period 8th November, 1948, to 18th February, 1949, when every person concerned had an opportunity to tender evidence on behalf of his particular interests in the matter.

Among other things, the Board recommended, as the result of the public inquiry, that the development of the industry be assisted by the Government to the extent of 1/8 per square yard, given:—

- (a) wholly as a bounty on cloth produced in Australia; or
- (b) partly as a bounty on cloth produced in Australia and

partly as a duty on imported cloth;

as may be decided by the Government after consideration of the various questions of financial policy which may be involved.

Prior to the Tariff Board's report being considered by the Government a complete examination of the report was made by a special committee representing the Departments of National Development, the Treasury, Labour and National Service, Fuel Shipping and Transport, and Trade and Customs. From this examination the following points emerged:—

1. The Australian artificial silk weaving mills are equipped with

modern plant and the two largest have become established under the guidance of leading technicians from the United States of America and Canada. The local industry is efficient and there is no reason to doubt that given sufficient encouragement it will, in the future, rank in efficiency and low costs with overseas producers.

2. The importation of automatic looms for weaving fine rayon fabrics commenced early in the year 1941 as a result of negotiations between the Government and Australian textile interests. These negotiations took place by reason of the position that the major pre-war sources of supplies of rayon fabrics namely, Japan and European countries, had been cut off. This caused a serious shortage of clothing materials and also of important defence requirements, such as aeroplane and parachute fabrics.

3. For a short period following the end of the war, the local industry was able to dispose of its products on account of the paucity of available supplies from overseas. From the year 1947 onwards, however, supplies more than ample to

meet the Australian demand became available from overseas.

4. In regard to quality, the local products compare favourably with imported products and it was shown at the time of the Board's inquiry that on 12 lines out of 46 samples of locally produced woven artificial silk piecegoods the local manufacturers' prices ranged from equality down to 18d. per square yard less than the prices of comparable lines produced by United Kingdom manufacturers. Since the Board reported, it has been established that intense competition from imports has altered that position to such an extent that the local industry is now finding it difficult to dispose of its products and, in consequence, is operating at a heavy financial loss. Naturally, under these circumstances local production has fallen off and plans made by the industry for progressive steps of development covering the period of the next three years, e.g., the installation of additional looms, have been curtailed considerably.

5. The future welfare and development of the local industry are

(Turn to page 42.)

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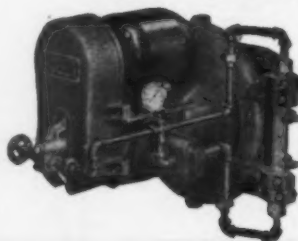
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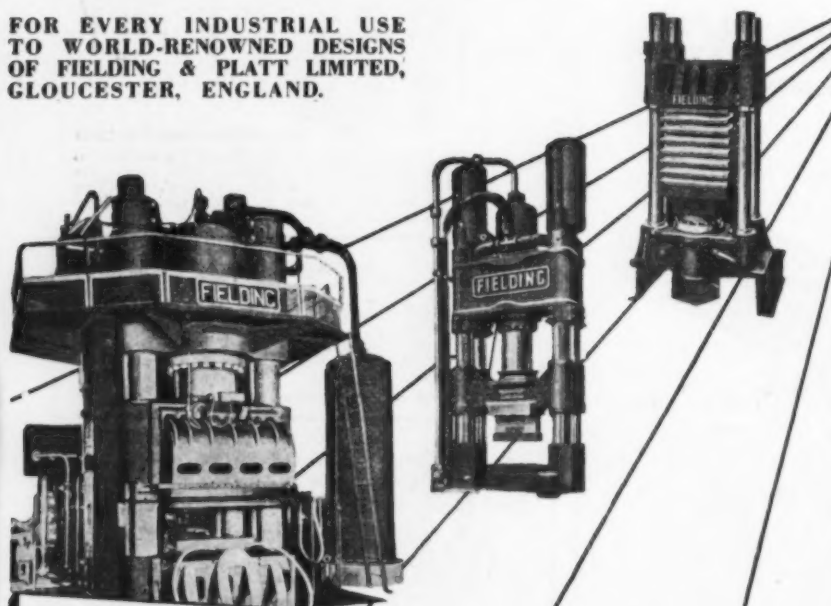
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(Continued from page 40.)

dependent upon a form of assistance which will have the quickest effect of restricting the present volume of imports.

6. A number of aspects should be taken into account in assessing the importance of the Board's objection—from a cost-of-living angle—to a "duty" form of assistance. Briefly these aspects are:—

- (a) heavy local stocks would prevent price increases for some time to come;
- (b) woven rayon fabrics are a relatively small and unimportant item in the overall cost of living;
- (c) the use of woven artificial silk fabrics is small compared with wool fabrics and cotton fabrics and hence movements in prices of woven artificial silk fabrics would have little effect on the general clothing price structure;
- (d) the demand would swing to cotton garments if the now cheaper garments made from woven artificial silk fabrics substantially increased in price;
- (e) Overseas F.O.B. prices of woven artificial silk piecegoods have decreased on an average by about 5d. per square yard since the time of the Tariff Board report and a further decrease in those prices is probable if protective duties are applied;
- (f) United Kingdom manufacturers could materially drop export prices and still show reasonable profits;
- (g) Bounty administration is irksome and aggravating to industry and most detailed profit and loss accounts and balance sheet have to be prepared. Extensive investigations and checks have to be carried out by the Government and the actual protection may be so long delayed as to be too late to protect the industry.
- (h) the industry has an important defence significance and should be expanded and developed within the earliest possible period. This objective would be most quickly achieved by the maximum duty assistance that can be given within the limits of the Board's recommendations;
- (i) duty rather than bounty would allow the industry to move more quickly to meet the whole or a pre-dominant part of Australian requirements. Thus, on a long-term basis, duty would be more effective in keeping down costs to consumers;
- (j) the import duty rates on woven artificial silk piecegoods applied by countries long established in the production of such piecegoods, e.g., the United States of America, the United Kingdom and Canada, are higher than the level of assistance recommended by the Tariff Board for the Australian industry.

(Turn to page 44.)



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Model A.T.H.7	(1) 0/200 r.p.m.	(2) 0/2,000 r.p.m.	(3) 0/20,000 r.p.m.
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The required range is engaged by turning the knurled knob to the point clearly marked thereon. A push button, conveniently placed, enables the operator to obtain readings on the machine-set indicating needle, and examine the instrument, if required, remote therefrom. By pressing button on opposite side of instrument, needle returns to zero.

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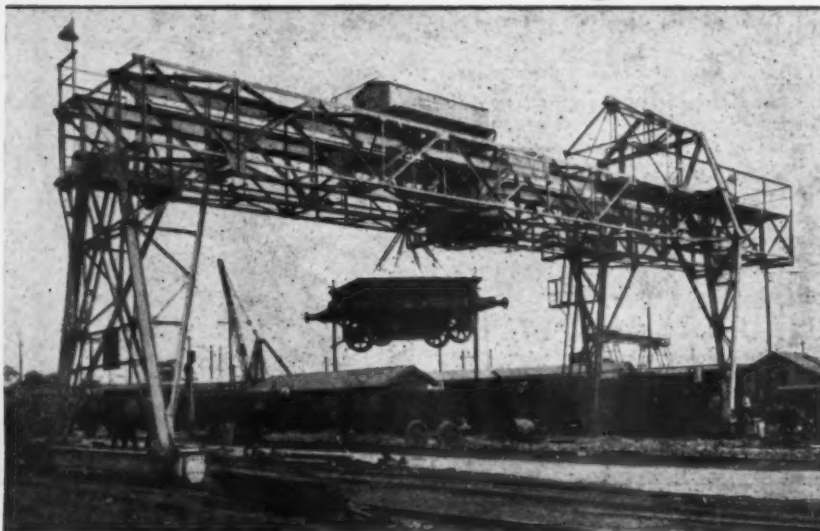
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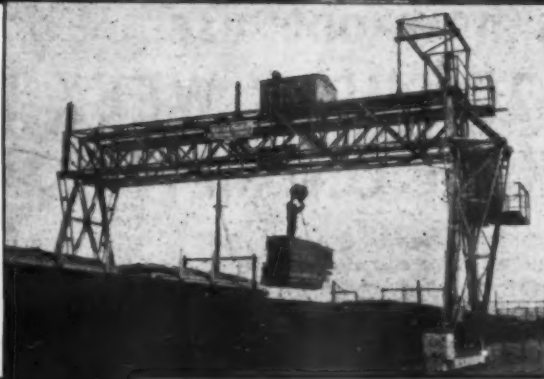
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The lower illustration shows one of a number of Gantry Cranes supplied to the Victorian Railways for handling goods on sidings. It has a capacity of 15 tons; the 55 ft. bridge spans two railway tracks and a roadway.

GE45

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(Continued from page 42.)
Duties in these countries are invariably levied at a specific rate plus an ad valorem rate, a method which has the effect of protecting the local industry in those countries over all grades of production;

(k) duty rather than bounty would encourage overseas manufacturers to establish in Australia. It is known that some overseas manufacturers are awaiting announcement of the degree of tariff protection to be accorded the Australian

industry before finalising plans to produce here;

(l) Protection by duty is the quickest and most effective way of restricting importations of artificial silk fabrics to a degree that will allow local manufacturers to com-

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pete for that proportion of the demand for which their combined plants have the capacity. In fact one of the complaints made on behalf of the United Kingdom manufacturers was that the new duties would result in an expansion of the Australian industry.

In view of the emphasis placed by local manufacturers on the necessity to keep their prices at the lowest possible level and of the ability of the United Kingdom exporters substantially to absorb any cost increases caused by duty, protection by duty to the fullest extent would, in this instance, cause little or no upward trend in local selling prices. Local manufacturers could operate profitably at present prices provided they were in a position to dispose of the whole of their output. The industry has emphasized that it seeks increased markets, not increased prices.

The Government is satisfied that the supplies of artificial silk piece-goods in Australia at present are such that any immediate rise in prices is unjustified. As an instance of the evidence received in this connection it is mentioned that recently an Australian manufacturer with heavy stocks on hand enquired of one of the largest metropolitan users why no orders were being placed. The reply received was that eighteen months' stocks were held.

It was only after considering in detail all the issues involved that the Government decided that the imposition of the full assistance recommended by the Tariff Board should be applied in the form of duty.

We should not allow the products of countries whose hours are longer and whose wages are lower to compete in an unfair manner with local products. Australians generally will endorse the view that Australian industry must be granted reasonable protection against an influx of imports such as we experienced from Japan in pre-war days. Nor should we fail to take notice of evidence which clearly indicates that certain European countries are subsidising export industries and so enabling their manufacturers to quote prices with

(Turn to page 51.)

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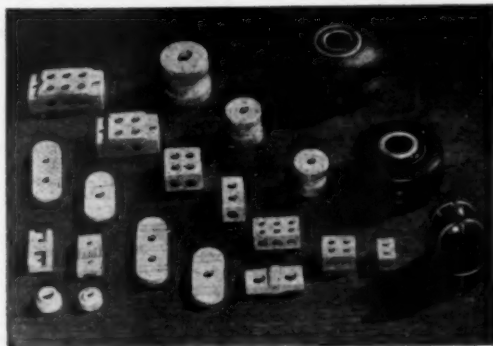
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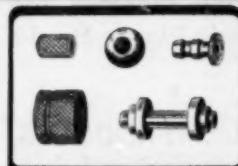
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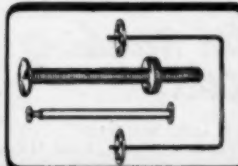
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S.A. Premier Inspects Chrysler Dodge Plants

Lincoln and Canberra Bomber Work in S.A.
as well as Car Bodies

Many features of considerable industrial interest, and several major developments of major importance, were seen in a tour which the S.A. correspondent of "The Australasian Manufacturer" was recently privileged to make of the three great plants of Chrysler Dodge De-Soto Distributors Ltd., at Keswick, Mile End and Finsbury, respectively, in South Australia. The tour was extended to a fourth associated plant, namely, that of Steel Pressings Ltd., a C.D.D. subsidiary, at Finsbury.

The writer was accompanying the South Australian Premier (Hon. T. Playford), who was escorted through the works by the C.D.D. managing director (Mr. W. D. Ferguson), chairman of directors (Mr. R. S. Thomson), another director (Mr. H. H. Pittman), general manager (Mr. A. B. Barker), chief engineer (Mr. R. C. Rainsford), and assistant factory manager (Mr. D. L. Elix). At Steel Pressings Ltd., Mr. F. A. Wallman, factory manager at this establishment, joined the party.

AN innovation at the Keswick plant of Chrysler Dodge De Soto Distributors Ltd. is a school for twenty young men for die fitting. It was explained to the party of visitors that owing to the difficulty of getting skilled labour for this work, the management had selected employees of good average intelligence and were putting them through a three months' training school. Starting from the fundamentals of how to handle files, hacksaws, etc., they were going through an intensified course, at the end of which it was considered they would be trained to a stage where they could be placed in the toolroom.

The party was interested to observe a testing device in operation for opening and shutting a motor vehicle door to prove beyond doubt the efficiency and long life of the door lock. They were told that this device did the opening and shutting operation as many as half a million times in some tests. In another test a 140-lb. weight was being dropped on motor vehicle seats to try the springing; while shock absorbers were also being operated to as many as two million cycles of their movements.

In the giant press-shop we saw body components of motor vehicles being pressed out by latest methods.

In the visit to the Mile End plant the long assembly lines, similar to those read of in the great American automobile factories were seen. It was announced that the extensions to this main assembly plant were nearing completion and would give an additional 50,000 square feet floor space—an increase of about one-fifth on the existing floor area. This would make possible an improved layout of the assembly lines under which there would be several shorter lines instead of the existing two very long ones.

The extensions will also house a new paint shop with latest modern equipment.

At Finsbury, in the aircraft division of Chrysler Dodge De Soto Distributors Ltd., the party saw work being done by this organisation as South Australian sub-contractors of the Department of Aircraft Production. The company has made a useful contribution to the Lincoln bomber construction programme, including fuel tanks of 500-gallon and some other capacities, also sheet metal assemblies and sub-assemblies and the manufacture of thousands of parts monthly. An interesting piece of plant in the aircraft division is a 3,000-ton hydraulic rubber press.

Through this organisation, South Australia will share in expanded activities in the Commonwealth's aircraft production programme including the Canberra twin-jet bomber, which the Minister for Air (Mr. White), on his return from abroad recently, described as being acknowledged by experts to be the World's best light bomber type.

In the large Finsbury building occupied by Steel Pressings Ltd., a very fine plant has been brought to a high pitch of efficiency within the twelve months since this company started off from an empty building. The arrangement of plant and the conditions provided for work are alike of the most modern character. The great presses are each placed at an angle in the press line, giving easier access for loading and unloading, as the stillages can be taken directly to each press without the necessity for turning at right angles. Steel Pressings Ltd. is making chassis contents for C.D.D., including fuel tanks, fenders and engine hoods—parts which were formerly imported but



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now made here to build up the Australian content of the chassis. Refrigerator doors were also seen being made for Kelvinator Australia Ltd. Steel Pressings Ltd. is an "incentive shop" and a good start has been made in introducing incentive systems of payment to encourage output, and this has been accepted by the Sheet Metal Workers' Union to which the employees belong. The factory was described to us as a very happy one, as the employees were pleased with the way the incentive scheme was enabling them to increase their take-home money. There is very little absenteeism, and labour turnover was small, most of the workers having been with this subsidiary throughout its twelve months existence to date.

Steel Pressings Ltd. represents an excellent achievement in methods engineering. "Before we start a job we work out the best method for handling it," Mr. Wallman explained. "As a result, when the operator gets on to the job he or she has every possible provision for comfort and convenience of handling the work, giving greater contentment, efficiency and time saving. As far as possible the operator does not have to move about to pick up material or take it away. If we have an extra tall operator, we prop up his machine to a height where he does not have to stoop. We had the advantage of starting with an entirely clean sheet in the former empty building, and claim that the establishment to-day is really a 'dream factory' from the viewpoint of methods engineering and production engineers."

Because the Keewick and Mile End plants are virtually landlocked, being in areas where there is little or no scope for extension, the C.D.D. group must look to expansion at Finsbury to further build up the Australian content of the cars and other motor vehicles handled, and to provide for the very great expansion foreseen in aircraft construction following the return from abroad soon, of the factory manager (Mr. R. G. Moore). Additional land has been purchased adjoining the aircraft division and re-arrangement of certain buildings is contemplated as well as likely building extensions.

N.S.W. MAN IN KELVINATOR SALES PROMOTION POST.

Mr. Clarrie Stone, formerly manager of Rava (Albury) Pty. Ltd., an affiliated company of Rava (Sydney) Pty. Ltd., refrigeration engineers, has been appointed to the sales staff of Kelvinator (Australia) Ltd., at Kenwick, S.A. He will also combine with this position the oversight of advertising. Earlier in his career Mr. Stone was for 17 years with Lysaghts' Newcastle works, becoming secretary to the chief engineer; and he has had considerable training in industrial management.



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Machining Small Die Castings

Tooling that combines machining operations and provides fast, easy loading

Die casting is a fast, economical method of producing many types of small parts in large quantity. But when flash must be removed or other machining performed, this saving will be lost unless the tooling handles the quantities involved in fast, simple fashion. Here is how an overseas company handles typical small die castings to get these results.

IN lock cylinders, most holes are cored, sometimes from three or more directions. Where cores intersect or meet, as in the case of tumbler holes and side holes, all radial, flash is left at the junctions and must be removed. For the cylinder shown at A in Fig. 1, there are six radially cored tumbler holes with walls only a few thousandths thick between holes. These join a side hole 90° around the cylinder and flash at the junctions has to be removed.

This is done in a fixture (Fig. 2) which has a hole that fits the diameter of the straight cylindrical portion of the piece. When pushed into this hole, the casting is located in correct angular position (with the keyslot vertical) by a pin that fits another cored slot on the back end of the cylinder.

Six vertical broaches are spaced to fit the tumbler slots and clamped together in a holder operated by the press ram. There is also a single horizontal broach that enters from the right side and is cam operated. The end of this broach is serrated and has a projection that enters the lower part of each tumbler slot from the side. As the press closes, the horizontal broach is first advanced by the

cam, shearing off flash at its end projections, and at once retracts by cam action.

Immediately thereafter, the six vertically operated broaches enter the cored tumbler slots and clear these slots of flash. In so doing, some flash burrs enter the side holes previously broached so, on the upstroke of the ram and after vertical broaches are withdrawn, the horizontal broach makes a second stroke removing burrs left by the vertical broaches. The operator loads each piece, trips the press and then moves a hand ejector lever that pushes the piece out of the fixture. About 1150 pieces are broached per hour. Guards normally used in this set-up were removed to photograph the fixture.

Another operation for removing flash in the side bar recess of lock cylinders, says Herbert Chase in an article in "The Machinist", is done on a filing machine (Fig. 3). Although called a "file", the tool, which is reciprocated rapidly and continuously in a fore-and-aft horizontal motion, is more or less like a broach whose five teeth cut as a result of this motion. All the operator does is to lay the piece in a slot that it fits and hold it down

on a seat. When he does so, the file enters the slot in the casting and clears any flash therein. Depth of cut is controlled by the seating of the piece. This rapid, simple operation can be performed by unskilled labour.

Radio antenna holders are cylindrical die castings (B, Fig. 1) that require a chased thread on one end and also on a side nipple near the other end. There is also a longitudinal lug that requires a tapped hole parallel to but not in line with the axis of the piece. A short steel stud, threaded over its entire length, has to be screwed firmly into this hole. All these operations are performed in machine (Fig. 4) after the casting is locked horizontally in a holder on a sliding bed.

After the holder is loaded, it is moved automatically to a rear position where three heads feed in. Two have chasers that thread one end of the piece and the side nipple, then expand and are retracted. At the same time, a hole is drilled in the lug and a fourth spindle picks up the threaded stud from the fifth-position chuck. Finally, the holder shifts into line with this stud-setting spindle and it screws the stud into the drilled hole, then backs off. While this operation proceeds, the operator inserts a stud into the chuck in the fifth position, ready for the next part.

With this set-up, 400 pieces an hour are completed.

Chevrolet fuel-pump covers include a flange that must have its face ground and the edge of this face burnished, operations performed respectively on the large and small wheels of the machine in the foreground of Fig. 5, with casting held by hand. Upon completion of these rapid operations, the operator slips each casting into a magazine of the machine in the background of Fig. 5. This machine is completely automatic and is equipped with three heads. Those at each side carry one tap each. These feed into holes that are in line with the taps when the piece reaches the bottom of the magazine and is locked automatically. At the same time, two other taps, operated by a head on an incline above the casting are fed in and tap two holes at right angles to the first pair. When the taps retract, the machine unlocks and ejects the piece, another drops into position from the magazine and is locked to start the next cycle. With this rapid set-up, the total time per piece, including grinding and tapping operations, is only five seconds. Formerly, this same job required two operators.

PLUNGER CAPS.
Plunger caps (C, Fig. 1) are $\frac{1}{2}$ in. OD and $\frac{1}{8}$ in. long. They are

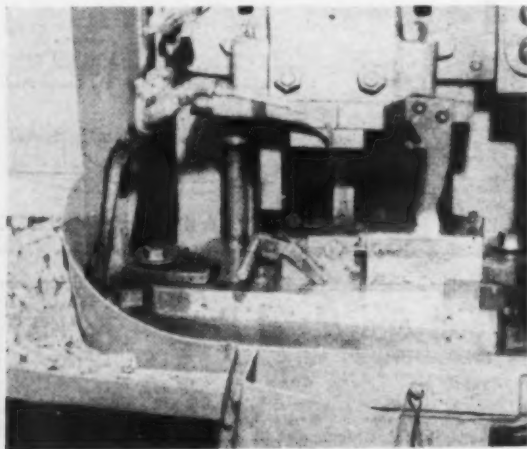


Fig. 2. Broaches attached to ram and on slide operated by cam from press ram remove flash from cored holes in lock cylinders.

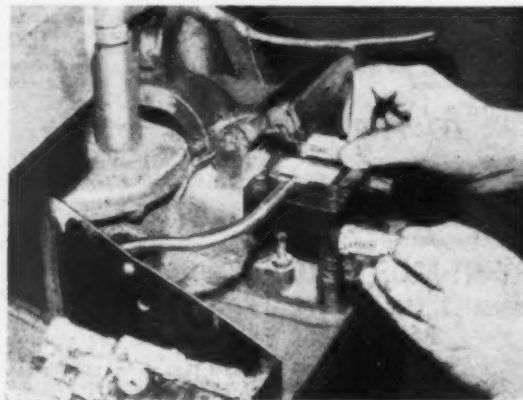


Fig. 3. Flash is removed from bottom of side recess in lock cylinder by a 5-tooth reciprocating file.

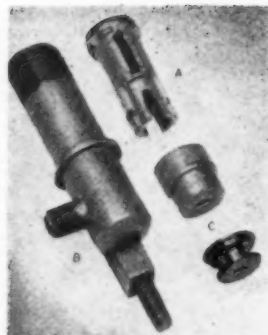


Fig. 1. Die-castings, machining of which is described, include lock cylinder A, antenna support B, and plunger cap C, as it appears before and after machining.

die-cast partly because an axial hole of oblong section, that is easily cored in die casting, is required through the finished piece. It would be expensive to provide such a hole if the part was cut from bar stock, but the casting is rapidly machined on the outer diameter, then is cut off to length in a screw machine used as a chucker (Fig. 6).

This machine is fed from a partly removable magazine, the removable sections of which are loaded by hand while supported in the holder shown at left in Fig. 6. As each casting reaches the end of the magazine, it is picked off by a hollow turret tool that advances the piece into the spindle collet where it is locked against a stop. A form tool on a cross-slide then is advanced to give the outer half of the piece (which is solid except for the small cored hole at the centre) a spool-like shape. Then the piece is cut off leaving a short ring of scrap in the collet. As soon as these tools retract, the ring of scrap is ejected.

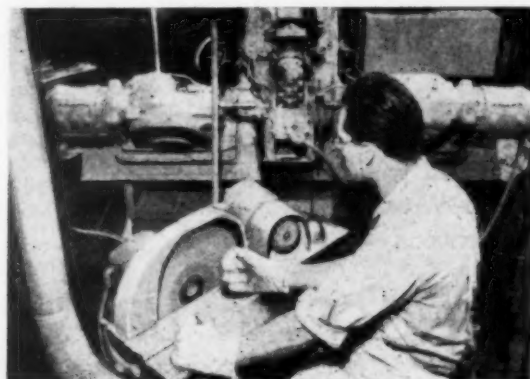


Fig. 5. Fuel-pump covers are ground on the face and burnished on the edge, then placed in the loading chute of the tapping machine in the rear.

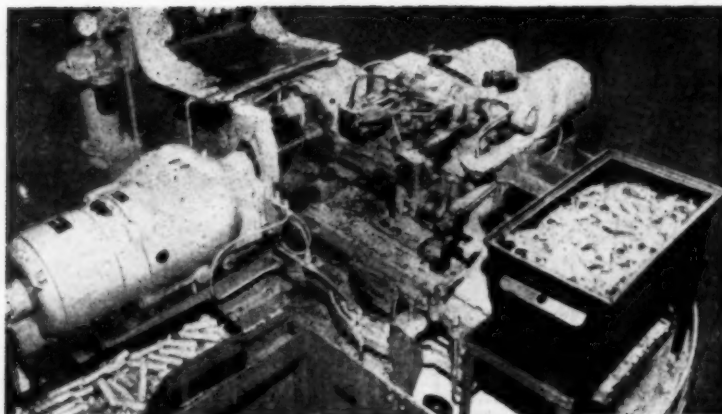


Fig. 4. Antenna supports are tapped at two points while a hole is drilled in a lug, tapped, and a stud inserted in the tapped hole.

This machine runs automatically, the only labour required being that for set-up, for loading the magazines and putting them in place, and for checking occasional pieces. 450 castings an hour are machined.

Modern Iron Foundries

(Continued from page 28.)

The high cost of electric power militates against the general use of electric melting in iron foundries, though quite a number of electric furnaces have been installed for the production of special castings. Rotary furnaces came into favour some 15 years ago, but that phase seems to have passed and the trend is now against their use. Oil-fired crucibles are also used to a limited extent.

SUBSTITUTE MATERIALS.

Gating and feeding techniques have been accorded more attention and a general improvement has resulted from their more intelligent application. Another interesting development on the foundry floor has been the use of substitute materials to overcome the shortage of bentonite clays brought about by the war. United Kingdom proprietary bonded clays are being successfully employed. Necessity has also led to the development of substitute core-bonding materials. Manufacturers of synthetic resins have made considerable progress in this field, and it remains to be seen whether their products have come to stay.

Core blowers are coming into increasing use; this development has been greatly assisted by a study made with the aid of a high-speed camera, which showed how the sand flowed in the air stream and what was required to allow it to pack uniformly.

Heat treatment is now being applied as successfully to iron castings as to steel, and greater appreciation is being shown of its advantages, particularly for stress relief.

Finishing methods have been improved by the growing use for light and medium castings of airless units of the revolving barrel, turntable or tumbler types. Hydroblast plants have been installed in various foundries for the cleaning of medium and heavy castings.

Many new openings for cast iron created during the war through the strain on the steel industry and forging plants have now become firmly established. Among them are gears, racks and spindles for machine tools; wheel centres, winch and brake drums for tractors and excavators; side frames, dies and piercing points for forging and extrusion presses; gears, crankshafts, camshafts, heads and rocker arms for internal combustion engines

(Turn to page 51.)

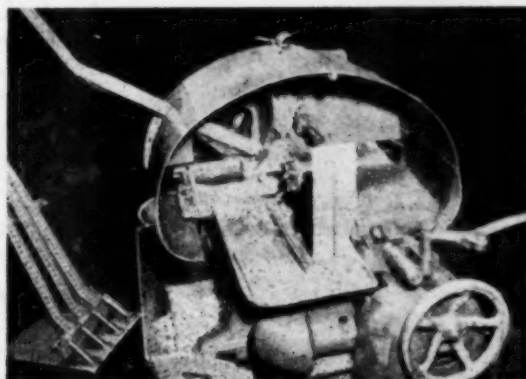
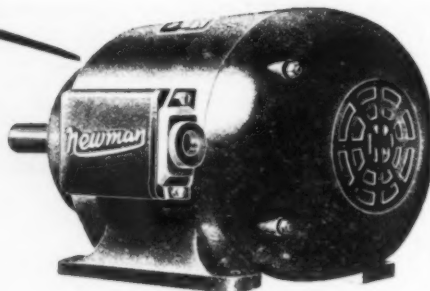


Fig. 6. Plunger caps are fed from the removable magazine at left to this automatic screw machine being used as a chucking machine.

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(Continued from page 49.)

and compressors. The scope for cast iron has also been greatly widened by the tremendous technical advances which have taken place.

USE OF ALLOYS

The use of alloys in cast iron production in Britain also continues to increase. Nickel is added to give rounder and stronger castings. High chromium irons have been developed for heat and corrosion resistance, silicon for acid resistance. There has been a steady increase, too, in the use of alloy irons of the abrasion-resistant type, while the progress of oil refining in Britain has stimulated demand for the austenitic types.

Most important of current developments in the iron foundry industry is the treatment of grey cast iron to produce castings containing graphite in spheroidal form. As cast, the product is characterised by high strength and appreciable ductility. Suitable heat treatment increases ductility and gives tensile properties at least equal to those of the best conventional malleable irons. Tremendous interest has been taken in this process, which is fully patented and, is being systematically developed. Castings for the automobile, agricultural and general engineering industries are now in regular production.

The British Cast Iron Research Association carries out fundamental research and has grown in size and stature in recent years. Its revenue is now derived from a small levy on pig iron, so that all foundries are, in effect, members with the right to ask for assistance in their problems.

A notable feature of post-war development is the determination of the industry to improve working conditions in foundries and to attract the best type of recruits. Increased attention is also being devoted to the provision of adequate training facilities for future technicians and artisans. The former British Foundry School has been re-opened as the National Foundry College and both theoretical and practical training is being given by many firms.

Rayon Industry Protection

(Continued from page 44.)

which Australian industry, unaided, cannot hope to compete.

As regards the present duty the Government's readiness to meet special circumstances is shown by its decision that all rayon piece-goods in bond in Australia or in transit to Australia on June 9th will be admitted under Customs Ex-law 449B. The practicability of affording further relief in any special circumstances of hardship, particularly in respect of types of cloth at present not available from local manufacturers, will be fully examined.

It is noticeable that whenever an alteration of duty is made there are strong protests from those whose industry is affected. Notoriously, it is completely futile to hope that any alteration of duty will be universally popular. Conscious of that circumstance, the Government is determined to pursue a policy which will benefit and strengthen the overall Australian economy.

Objections to the decision to afford this industry a measure of protection are almost identical with those raised when protection was afforded the Australian woollen textile industry. Yet between the two wars, that industry, because of the protection afforded it, was able to save the Australian people millions of pounds as well as develop a substantial export market.

PAINT EXECUTIVES OF CLARKSON'S.

Mr. J. A. Errington, who for about 30 years has been manager of the paint department of Clarkson Ltd., Rundle Street, Adelaide, retired from the management of this department on June 30. He has not severed his connection with the firm, but he transferred to less onerous duties because of the state of his health.

His successor in the paint department management is Mr. Ben Brice, Clarkson's paint sales organiser and former assistant manager of the department.



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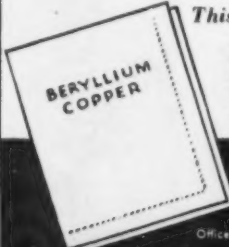
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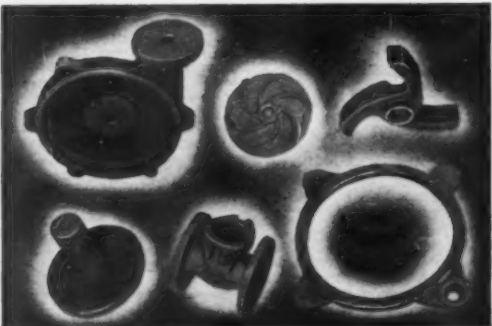
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Silver rods that bend like lead but cannot be unbent. Metal wires that can be stretched as easily as a piece of taffy—once, but not a second time. Such are the characteristics of trick metals developed by Professor E. N. daC. Andrade, world authority on metallurgy, at London's University College.

The ordinary piece of metal is made up of a myriad of microscopic crystals. By contrast, the rods that bend and wires that stretch are single crystals several inches in length. It is this monocrystalline structure of Professor Andrade's metals that gives them their special properties, says a report in "Product Engineering."

Of what practical value is this work with metals that exist only in specialized laboratories? It is well known that even the toughest steel producible is only 1/40 as strong as it theoretically could be. "Where so many of the dreams of inventors are clearly impossible on simple grounds of energy and related fundamental considerations, gigantic advances are here, at any rate, not inherently ruled out," Professor Andrade declares.

A one-half-inch single-crystal wire can be stretched under loads

of 2 to 20 lb. depending on the metal. But once the wire is pulled, or the rod bent, the metal undergoes a strange toughening. A single-crystal copper wire can easily be pulled to twice its original length; it then requires 80 times as much force to stretch it further. X-ray analysis indicates the reason for this is that stretching destroys the single crystal structure of the metal.

Another unusual characteristic of single crystal metals is that, regardless of the direction of the pull, they insist on stretching in directions of their own choice. Nor does the wire stretch uniformly. Rather it elongates in spurts along certain very definite glide planes.

The result of this stretching action is a peculiar flattening of the wire, accompanied by curious steplike ridges, as if the crystal had moved in layers. These steps are slip-bands and can clearly be seen with the naked eye. The distance between the bands varies with different metals and with temperature. Sometimes a single crystal will exhibit several slip planes at angles to each other and frequently twinning occurs, with two sets of bands that are mirror images.

The softness and gliding properties of single crystal wires Professor Andrade explains on the basis of imperfections in the surface layers of atoms, ultra-microscopic "cracks" in the atomic "skin" of the crystal. Thus, a coating of oxide only 20 atoms thick will increase by 50 per cent. the force required to stretch a 0.5 millimeter wire, while thicker films will double the stress required. Also, bombarding a wire with alpha particles while it is being stretched, markedly increases the rate of flow of single-crystal cadmium in the early stages when fresh glide planes are being formed. Since alpha particles have no penetrating power, this can only be a surface effect.

It is possible that internal flaws may play a part in this crystal behavior, but so far surface defects are the only ones whose

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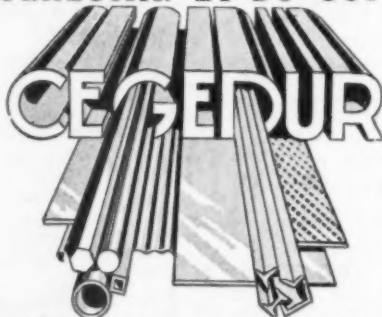
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effect has been definitely proved in the case of metals.

Analogous deductions can be made from the experimental weakness of non-metals like glass, quartz and rock salt as compared with their theoretical strengths. In each of these cases, it has been shown that the weakness lies in minute cracks in their surfaces, cracks which can be made visible by exposing them to sodium vapour. In the case of sheet mica, the surface of which is remarkably free of flaws except at the edges, it has been shown that the strength of such sheets is ten times greater when the stress is kept solely on the perfect surface than when it extends to the imperfect edges.

To make his single crystals, Professor Andrade encloses an ordinary polycrystalline wire in a glass tube in which it fits loosely and from which all the air has been evacuated. He then runs a travelling furnace slowly over the tube at a rate of about one half to one inch per hour. The wire melts locally and then re-solidifies as a crystal.

One lesson learned from the study of the single crystal is that, because of atomic flaws, the individual metal crystals are exceedingly weak. The greater strength of every-day metals lies in their haphazard polycrystalline structure, with the glide-planes and glide-directions of the crystals oriented at random. Thus, each crystal is hemmed in by other crystals that will not readily "give" in the same direction or plane in which it moves most easily. This is much like the principle of the girder, in which the planes of several sheets of metal are fixed at right angles to each other.

Professor Andrade believes his experimental results point out

two tasks for the practical metallurgist: (1) To see if the atomic flaws in metal surfaces can be eliminated; and (2) if not, to see how the polycrystalline nature of metals can be increased.

INCREASED MACHINERY EXPORTS.

According to the latest Bulletin issued by the Commonwealth Bureau of Statistics, a steep rise occurred in Australian exports of plant, equipment, and machinery in 1948-49 by comparison with previous years. During the year in question, for example, Australia exported £1,071,177 worth of engines compared with £45,275 in 1938-39, and £965,249 in 1947-48. While there was a falling off in the export of mining machine tools and sewing machines, exports of other machinery rose from £2,966,773 in 1947-48 to £3,097,580 in 1948-49. (The 1938-39 figure was £399,899).

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VISIT OF PROMINENT CIVIL ENGINEER.

At present in Australia on a three months' tour which will embrace all States and New Zealand, Mr. J. A. Hill, General Sales Manager of Frederick Parker Ltd., of Leicester, England, plans to view at first hand, civil engineering developments in this country, with particular reference to their application to Water Conservation and Hydro-electric projects; to discuss plant and equipment problems generally with engineers of Government Departments, Public Bodies, Local Governing Bodies and Contractors; and to confer with the company's Australian Agents—Messrs. Norton, Toothill & Company Pty. Ltd., of Sydney, Wollongong, Brisbane and Melbourne.

Mr. Hill has had an unusually wide experience in the field of Civil Engineering Equipment. He has been with Frederick Parker Ltd., for 33 years and was associated with the founder of the



Mr. J. A. HILL,
of Frederick Parker Ltd.

company, Mr. F. M. Parker. As General Sales Manager, he has been active in many large engineering projects in all parts of the world.

Frederick Parker Ltd., of Leicester, England, is one of the world's leading makers of Civil Engineering Equipment and has participated in numerous large water conservation, hydro-electric and other Civil Engineering projects. The company was one of a group of English firms who, under the co-ordination of Messrs. Pauling & Co. Ltd., England, supplied the whole of the plant used in the construction of the Castelo-do-Bode Dam across the Zesere River in Portugal. This is part of a huge project for the supply of electric power to Lisbon.

BALLARAT PAPER MILLS.

Developments at the Ballarat Paper Mills Pty. Ltd., Ballarat, Victoria, have proceeded at so satisfactory a tempo that recent weeks witnessed a trial run of the smallest of its four coated art paper machines. Six English papercoating technicians reached this country recently to form the nucleus of the staff and to train local operatives.

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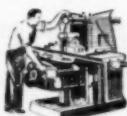
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PATENT & TRADE MARK NEWS

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Provision is also made (Patents Act, 1946) for an applicant to obtain damages, if infringement occurs, from the date of publication of the application. A rule of practice has been established whereby an application will be examined more speedily when a prima facie case of alleged infringement is proved.

Particulars of the necessary procedure will be supplied by any Patent Attorney practising in the Commonwealth.

PATENT SPECIFICATIONS ACCEPTED

MACHINE FOR PLANING CURVED SURFACES.

197,507.—D. A. Deary and G. W. Deary, W.A.

To plane cast staves or the like after bending, a machine comprises a thickening head, a curved table and resiliently mounted feed and lead out rollers. The curved table centrally supports a roller adjacent to the thickening head.

HARVESTING SUGAR CANE.

197,508.—Fairymead Sugar Co. Ltd., Qld.

To prevent the leafy tops being gathered with the cut cane, the tops are cut into several short sections by the attachment to a sugar cane harvester of a power-driven upstanding shaft carrying

a number of vertically spaced rotatable cutting blades and a number of vertically spaced stationary cutting blades, together with means for feeding material to the cutters.

In an embodiment disc knives mounted on a separate shaft are adapted to sever the cane tops in advance of cutting knives.

DISC SHAPED COIN-OPERATED MECHANISM.

197,509.—H. Rooklyn, N.S.W.

To reduce the number of parts and to avoid springs or the like liable to fatigue, a rotatable disc shaped coin receiving element is formed with a plurality of circumferentially and equidistantly arranged pockets each of a depth equivalent to that of the coin, so that a next successive coin received in the lower portion of the chute may temporarily ride edgewise upon the coin which is nested in the pocket and so

operate the switch by striking the bent portion of the spring actuated lever.

COMBINED POWDER CON- TAINER AND SPRAYER.

197,510.—S. Morris, N.S.W.

A container for powdered substances which may also be made to function as a spraying device comprises, a body with a bead to facilitate the placing on of the lid when the body is filled with powder, the bottom portion of the body being formed of flexible material pressed outwardly, and adapted when pressed by the fingers to eject powdered substance from the orifice when the closure is opened.

FLUSHING VALVE, WITH EN- CLOSED MAIN VALVE.

197,511.—S. O. Johns, N.Z.

A valve body encloses a main valve and a seat, the main valve being guided and supported by

faces in a cap so as to form a closed chamber above the main valve; by-pass means permit the entry of water to the chamber and a pilot valve, when actuated, permits the discharge of water from the chamber allowing the valve to raise from its seat.

ELECTRIC KETTLE OF SIMPLIFIED CONSTRUCTION.

197,525.—Jason Industries Ltd. and Hans Robert Gerald, W.A.

To simplify construction, the lower part of the body is formed with one or more circumferential grooves, to take the insulated resistance wire, the ends of which are connected to the plug-in terminals. The resistance wire is retained in position by an encircling band which in turn is

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ELECTRIC HYDRAULIC LIFT- ING GEAR.

137,536.—A. Butcher, N.S.W.

An electric drive hydraulic lifting gear for tractor-drawn implements comprises: a battery-operated electric motor; a hydraulic pump adapted to be coupled to hydraulic lifting means for the implement; sleeve coupling means between the driving shaft of the motor and the shaft of the pump; and release valve means on the return hydraulic line between the hydraulic lifting means for the implement and the pump. Splines between the sleeve and the shafts will allow axial adjustment to the shafts and the lever operable to release the bleeder-valve, between the hydraulic cylinder and the reservoir, will allow retraction of the hydraulic piston operating the lifting ram for the implement.

TROMMEL.

137,536.—F. Rock, N.S.W.

To stratify the particles with the finest nearest to the screen surface, a rotatable sieve drum is mounted on supports which allow it to move transversely of its rotational axis and is driven by oscillating drive means. The drum may be supported on a crank pin and the crank shaft rotated faster than the drum.

In a modification the drum is supported by pivoted arms which are oscillated by an eccentric.

AUTOMATIC STOCK DISTRI- BUTION SYSTEM.

137,536.—Communication Engi-
neering Pty. Ltd., N.S.W.

A system for dispensing articles of various types and/or values from storage, wherein some or all of the articles are suitable for cooking comprises electrically operated means to release articles from storage, and routing means to selectively transfer released articles to cooking means and further means to deliver said articles either cooked or uncooked to predetermined locality or localities.

In one embodiment of a storage chamber is provided with delivery means leading on to a conveyor belt adapted to deliver to the cooking section or to a pre-determined locality, if delivery is to the cooking section then final delivery is effected by conveyor to locality.

The whole system is operated electrically through a series of relays from control panel.

HAIR WAVING CLIP.

137,541.—T. H. Potter, Vic.

A pair of lever members are angularly movable about a longitudinal axis formed by separable means consisting of a lug or lugs integral with a member and disposed to engage with a complementary recess or recesses in the lever member. The members are retained in operative connection by detachable spring means disposed around the portions to apply closing pressure upon the gripping jaws.



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A modified pivot means comprising a pair of recesses and a cylindrical hinge member to lie therein is also described and claimed.

OSCILLATION GENERATED. MAGNETRON.
137,548.—Amalgamated Wireless (A/asia.) Ltd., N.S.W.

To obviate the use of special coupling devices a magnetron oscillation generator has a cathode so situated in the electric field of an anode that the output energy may be derived through the cathode electrode.

The cathode may be oriented parallel to the electric field of the anode, and may be of the indirectly heated type. The anode element may be of cylindrical cross-section and may be formed with a plurality of radially disposed rods supported alternately by the ends of the anode cylinder, thus dividing the single resonant cavity into a multiplicity of segments. The cathode leads are adapted to conduct heating current to the cathode and to conduct oscillatory energy from the cathode to a utilization circuit.

SECURING PULLEYS TO SHAFTS.

137,549.—Ailzone (1931) Pty. Ltd., N.S.W.

A pulley for light duty is provided with a slot-like housing accommodating a nut, a shaft engaging screw being passed through a clearance hole in the boss and into the nut.

TRACTOR SUPPORTED PLOUGH.

137,551.—Daniel Harvey Ltd., Vic.

To counteract slewing and maintain a straight course a tractor borne disc plough has attached to a transverse connecting member a plough beam carrying one or more adjustable tilling discs and a variable gang of straight anchor discs which are rotatively supported on the member at one side of the tilling discs.

In a modification the anchor discs may have adjustment means operable while the implement is in use.

ROTARY GARDEN SPRAY.

137,550.—C. G. Hartley, Vic.

To water small areas a rotary sprinkler has end curved sprinkler arms which are provided with graded holes and project from a rotary head.

TRACTOR-SUPPORTED PLOUGH.

137,945.—M. A. H. E. Livesey, W.A.

To obviate surfacing of hard ground and ensure even depth cut a tractor supported plough has articulated and spring pressure controlled mechanism so that relative movement between the plough and the tractor is permitted when ground irregularities are encountered.

ELECTRICALLY DRIVEN ROLLER.

137,627.—R. D. S. Kaye, Vic.

For safety and ready control an electrically driven roller is constructed so that its direction of movement is controlled automatic-

ally by the position of the handle. The roller always moves ahead of the handle and is driven through gears, by a motor on base movable with the handle about the roller axis and driving only when the handle is in one of two convenient predetermined ranges of positions. The base carries mercury switches in the relative positions. When the handle is between 30 deg and 45 deg. to the horizontal, switches are closed to drive the motor in one direction, to drive in the opposite direction. At angles less than 30 deg. switch will open and at angles greater than 45 deg. switch will open, in either case stopping the motor.

CENTRIFUGAL CASTING MACHINE.

137,502.—P. G. Taylor (Newcastle) Pty. Ltd., N.S.W.

To cast bearing metal linings within cylindrical steel shells, a machine comprises a capstan drum mounted on a frame, a plurality of sleeve holders in the form of a head and tail stock peripherally mounted on the drum, a belt drive arrangement, whereby all but one of the sleeve holders are rotated, six follower pegs adapted to engage a helical groove in an indexing cam which is rotated by a pinion and a rack actuated by a pneumatic piston in the cylinder, thereby moving the drum through an angle corresponding to the pitch of the sleeve holders.

Molten metal is injected into the sleeve or shell from a pot having a feed cylinder therein communicating with an outlet nozzle which is in alignment alternately with each sleeve holder.

SADDLE MOUNTING FOR CYCLES.

137,504.—G. Bertozzi, Vic.

A resilient support capable of fitment to existing types of cycles has a number of overlapping plate springs, fixedly attached to adjustable posts and provided at the free end with means for connection to a saddle.

TRADE MARK APPLICATIONS

92,734. A circular design with the words "Roto-Finish." Tumbler barrels and supplementary equipment.—A. Flavell Proprietary Limited, 283-289 Hoddle Street, Collingwood, Victoria.

96,047. "Fleetwing." Toys.—Metal Forms Proprietary Limited, 473 Bourke Street, Melbourne, Victoria.

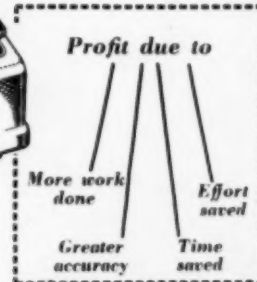
94,583. A label design of the letters "G.W." Hydraulic pumps; hydraulic direct-lift, arm-type, cam and roller, telescopic, mechanical hoists, etc.—Gar Wood Industries Inc., cnr. Railroad and Michigan Avenues, Wayne, Michigan, U.S.A.

95,125. "Langwal." Motor cultivators and attachments.—Langham & Wallace Engineering Pty.



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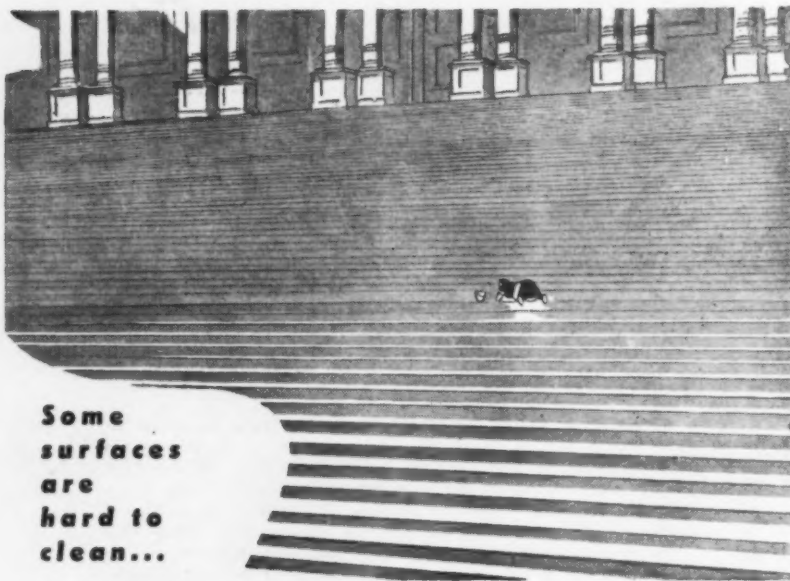


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93.175. A design of the word
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"T.B." Metal tiles.—Thomas
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ciated Newspapers Ltd., 60-70
Elizabeth Street, Sydney, N.S.W.

93.171. A design of the letters
"G.M.C." Motor driven trucks,
buses and other automobiles.—
General Motors Corporation, West
Grand Boulevard and Cass
Avenue, Detroit, Michigan, U.S.A.

94.909. "Pelanbe." Linen fab-
rics.—Paterson, Laing and Bruce
Limited, 264-282 Flinders Lane,
Melbourne, Victoria.

94.355. "Peterbee." All types
of travel goods, overnight bags,
etc.—Boynes Leathergoods Pty.
Ltd., Wilson House, Charlotte
Street, Brisbane, Queensland.

94.473. "Lacrinoid." Buttons.—
Lacrinoid Products Limited, Gl-
dea Park Works, Stafford
Avenue, Gldea Park, Essex, Eng-
land.

94.640. "Hillite." Articles made
from sheet plastic.—Holmes, Hill
& Company, 21 Pier Street, Syd-
ney, N.S.W.

TENDERS FOR PATENTS

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the owners of Australian Letters
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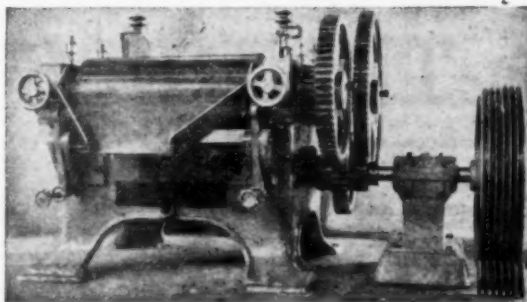
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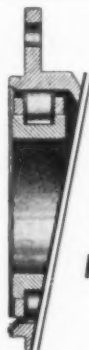
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(Turn to page 64.)



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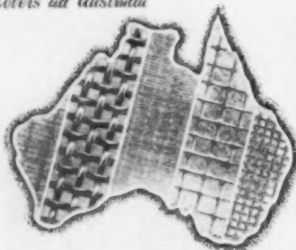
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(Continued from page 66.)

Screwcutting Tools (File No. C-
4/171/61). McPherson's Ltd.,
£388/3/6; Harris Scarfe Ltd.,
£156/6/6; Bennie Teare Pty. Ltd.,
£56/2/11.

Cooks' Ladies (File No. C4/175/
180). A. G. Way & Co. Pty. Ltd.,
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Aircraft Cleaner (File No. C4/
183/27). Dominant Chemical Co.
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Leather Strap Hides (File No.
C4/200/19). Geo. Pizzev & Son
Pty. Ltd., £271/12/1

Blouses, Battle Dress (File No.
C4/252/5). Caledonian House Pty.
Ltd., £6,503/3/9.

Pillowslips, Envelope Type (File
No. C4/258/74). The Label Trad-
ing Co. (Aust.) Ltd., £10,050.

Blankets, G.S. Grey (File No.
C4/259/34). Federal Woollen
Mills, £3,412/10/- and £17,062/10/-.

Laboratory Power Unit (File
No. C4/316/123). H. B. Selby &
Co. Pty. Ltd., £130/12/6.

Refrigeration Plants (File No.
C4/317/19). Eckersley & Sons
Pty. Ltd., £4,440; Coldstream
Refrigerators Ltd., £2,822; Quirks
Refrigerators Pty. Ltd., £3,000;

Refrigerator Installation & Ser-
vice Co. Pty. Ltd., £5,328.

Kelvinator (File No. C4/317/19).
Kelvinator (Australia) Ltd., £3,850.

Rasps, Wood (File No. C4/171/
51). William Adams & Co. Ltd.,
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Scissors (File No. C4/171/51).
William Edwards & Co., £334/7/6.

Rasps, Cabinet (File No. C4/
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Reamers, Hand Taper (File No.
C4/171/51). Westcott, Hazell En-
gineering & Steel Ltd., £56/12/-.

Saws, Hand (File No. C4/171/
51). John Farmer Ltd., £433/0/7.

Saws, Backed, Tenon (File No.
C4/171/51). Motor Parts & Ser-
vices Ltd., £474/10/10.

Tweezers (File No. C4/171/53).
McPherson's Ltd., £315/5/-.

Cutlery (File No. C4/175/160).
Myttons Ltd., £695/7/7.

Knives, Table, Large (File No.
C4/175/160). Bahers Agencies,
£242/2/10.

Paint, Millwhite (File No. C4/
178/72). Stirling Paint & Varnish
(Vic.) Pty. Ltd., £182/17/6.

Covers, File, Manila Board,
Brown (File No. C4/181/82). Asher
& Co. Pty. Ltd., £276.

Soap, Common Laundry (File
No. C4/183/31). G. W. Pennell,
£4,012/10/- and £10,432/10/-.

Blankets, Underlay, Wool (File
No. C4/259/41). Laycock, Son &
Co. Pty. Ltd., £1,800/14/1.

Blankets, Underlay, Wool (File
No. C4/259/41). Eagley Mills Pty.
Ltd., £3,075.

Drilling Jig (File No. C4/313/
170). E.R.L. Products, £113/9/6.

Canned Split Carrots (File No.
C4/106/399). H. J. Heinz Co.
Pty. Ltd., £2,107/5/10.

Cord for Kithbaga (File No. C4/
163/17). James Miller & Co. Pty.
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Fire Extinguishers, Portable
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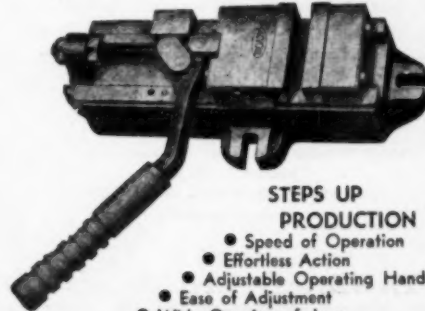
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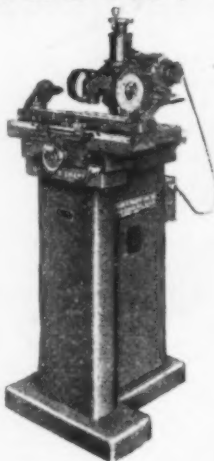
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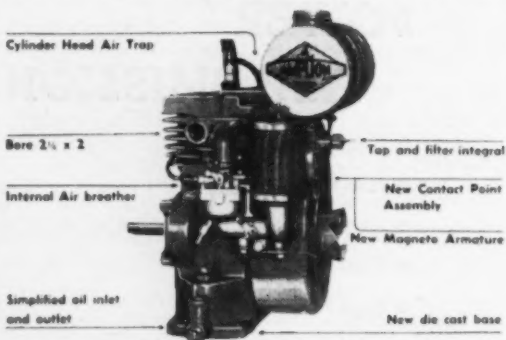
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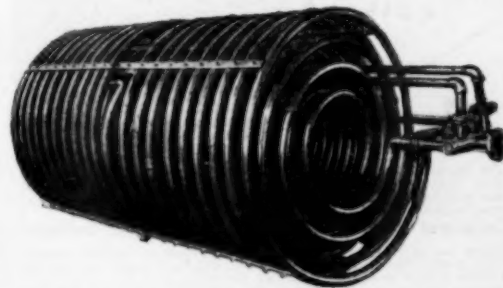
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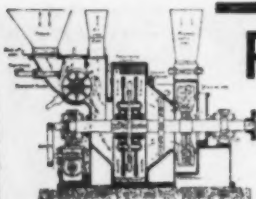
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Hounsfield Tensometer; Tensile Chucks, Nos. 11, 12, 14 and 16, four sets, £3/17/- per set; Stress Scales to suit Chucks, three, £1/9/- ea.; Rings for Tensile Chucks, four pairs, 11/6 ea.; Gauges for Elongation and Reduction in Area; Compression and Brinell Microscope; Hounsfield Punch Shear Apparatus, 5 mm. Ball; Extensometer, £319. William Adams & Co. Ltd.

Standard spectrometer, Hilger and Watts B1088, £255. Watson, Victor Ltd.

Student beam balances, two; 2 boxes of weights, with fractions, 100 gm.; 1 box of weights, 500 gm.; 4 No. 3123 co-efficient of linear expansion of metal; 3 No. 341 wheel and axle; 2 screw jacks; 3 constant volume air thermometers (No. 263 with air bulk attachment); 2 No. 3197 DuLong and Pettis apparatus; 30 slotted weights, 2 kg.; 9 No. 818 pulley blocks, £109. H. B. Selby & Co. Pty. Ltd.

Recorder, C.02; Fluxmeter, T.S., Caulfield, £113. A. E. Supplies Pty. Ltd.

Lathe, all geared headstock, 10 in. swing, 33 in. between centres, T.S., Stawell, £273. Qualas Sales Pty. Ltd.

Equip. for motor mechanics' dept., H.S., Mildura, £253. Auto Replacement Co. Pty. Ltd.

Motor mechanics' equip., £339. E. A. Machin & Co. Pty. Ltd.; £235. A. G. Healing Ltd.; £117. Motor Spares Ltd.

Shaping mach., 18 in. stroke, motorised, £492. Herbert Osborne.

Motor mechanics' equip., High Schools, Hamilton, Shepparton, and Swan Hill, £1,232. Repco Ltd.

Motor mechanics' equip., H.S., Hamilton, Shepparton, Swan Hill, and Warragul, £620. Brooklands Accessories Ltd.

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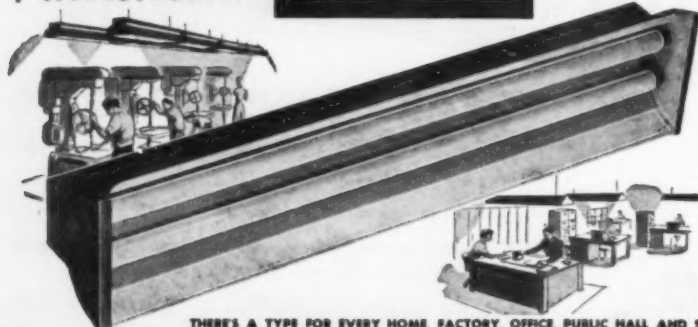
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Melbourne

CURRENT TENDERS

NEW TENDERS

The following tenders have been called since our last issue. Current tenders which have been published in previous issues follow this section.

COMMONWEALTH

POSTMASTER-GENERAL'S DEPARTMENT.

Braided Switchboard Cable (Sch. C.6355). Oct. 12.
Cabinets, Cross Connecting (Sch. C.6364). Aug. 24.
Cable Trailers, 5 ton capacity (Sch. C.6327). Aug. 24.
Conduit Rods (Sch. C.6375). Aug. 17.
Distributing Frames and Terminal Equipment (Sch. C.6378). Oct. 19.

Jacks and Number Plates (Sch. C.6359). Oct. 19.
Lanterns and Accessories (Sch. C.6376). Aug. 17.
Metal Cases, R.6 Labels (Sch. C.6381). Aug. 17.
Metal Reversible Labels (Sch. C.6382). Aug. 24.
Plugs (Sch. C.6363). Oct. 19.
Wiring and Jointing Tools, for Linemen (Sch. C.6377). Aug. 24.

DEPARTMENT OF SUPPLY AND DEVELOPMENT.

Kitchen Ware. Aug. 24.
Machine Tool Accessories. Aug. 24.
Sensitive Drilling Machines. Aug. 24.

DEPARTMENT OF CIVIL AVIATION.

Circular Saw Benches (Sch. 299). Aug. 22.
Component Parts, for Incinerators (Sch. 302). Aug. 15.

Generator Units, wind driven (Sch. 300). Aug. 29.
Power Generating Sets, 600-1,500 watt (Sch. 301). Aug. 29.
Voice Frequency Telegraph Equipment (Sch. 303). Sept. 19.

GOVERNMENT RAILWAYS DEPARTMENT.

Diesel Powered Rail Cars, 4 ft. 8½ in gauge. Oct. 3.

NEW SOUTH WALES

GOVERNMENT RAILWAYS DEPARTMENT.

Centre Lathe, 20 inch, sliding, surfacing and screwcutting gap, bed type (Quot. CE-1109). Sept. 11.
Centre Lathe, 6 inch, medium duty (Quot. CE-1124). Sept. 28.
Centre Lathe, 8½ inch, heavy duty (Quot. CE-1123). Sept. 28.

Coil Winding Machine, for layer winding of elect. coils (Quot. CE-1130). Sept. 28.
Cylindrical Grinding Machine, 10 inch (Quot. CE-1110). Sept. 11.
Drilling Machine, Pillar type, to drill 1½ ins. (Quot. CE-1126). Sept. 28.

Engraving Machine (Quot. CE-1131). Sept. 28.
Motorised Band Sawing Machine (18 inch), (Quot. CE-1129). Sept. 28.

Motorised high speed Sensitive Drill, 1 inch capacity (Quot. CE-1127). Sept. 28.

Power Hacksawing Machines (Quot. CE-1128). Sept. 28.
Sensitive Radial Drilling Machine, spindle radius, 36 inch (Quot. CE-1125). Sept. 28.

BOARD OF FIRE COMMISSIONERS.

Venetian Cloth, navy, 5,000 yds., 22 ounce, and 1,000 yds., 21 ounce (Turn to page 71.)

NICHROME RESISTANCE WIRE THE WORLD'S BEST

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NEW TENDERS — Contd.

and Navy Serge, 1,500 yds., 14/15 ounce, Aug. 21.

COUNCIL OF CITY OF SYDNEY.
Automatic Printing Press, Aug. 16.

DEPARTMENT OF PUBLIC WORKS.

Belting, Aug. 16.
Diesel Locomotives, Extended to Aug. 16.
Fire Extinguishers, Aug. 16.
Hot Water Calorifier, Aug. 16.
Hot Water Steam Heated Urns, Aug. 16.
Portable Electric Grinders, Aug. 16.
Steam Control Valves, Aug. 16.
Steel Tank Tower, Aug. 16.
Thimbles, Shackles and Crosby Clips, Aug. 23.
Turning Axles, Aug. 16.

FORESTRY DEPARTMENT.

Cable, Starter Battery, Aug. 15.
Electric Valve Lapper, Aug. 15.
Lathe Chuck and Back Plate, Aug. 15.

♦ ♦ SEE ALSO ♦ ♦ "LATE OPEN TENDERS"

Louvres (Windows), Aug. 15.
Polishing Mops, Aug. 15.
Septic Tank, Aug. 15.
Spotlights, 6 volt, Aug. 15.
Wire Rope, Aug. 15.

MARITIME SERVICES BOARD.
Fork Lift Trucks (2), one ton, battery operated, Sept. 4.

STATE CONTRACTS CONTROL BOARD.

Bakery Equipment, Aug. 14.
Counterpanes, Aug. 14.
Dustpans, Garbage Tins and Buckets, Aug. 15.
Elderdowns, Aug. 14.
Engine Indicator, Aug. 15.
Hair Brooms, Brushes, etc., Aug. 15.
Millet Brooms, Aug. 15.
Pen Nibs, Aug. 15.
Portable Soil Erosion Research Unit, Aug. 15.
Serviettes, Tray Cloths, Aug. 14.
Tablecloths, Hand Towels and Serviettes, Aug. 14.
Wool Dusters, Aug. 15.

MISCELLANEOUS.

Carbonising Plant, consisting of vertical retorts, for Bathurst City Council, Oct. 31.
Grading Unit, approx. 10,000 lb., with power controls and Tractor, 35-45 drawbar h.p., fitted with angle till doser, for Blaxland Shire Council, Aug. 18.
Medium weight Grader, fully automatic, hydraulic controls, 50-60 h.p., for Shire of Hastings, Aug. 21.
Power Graders (2), light medium, for Municipality of Canterbury, Aug. 30.
Sluice Gate, 36 inch diameter, and Headstock, for Jericho Shire Council, Sept. 5.

(Turn to page 72.)

IT CALLS FOR INSULATING VARNISH



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Modern electrical engineering demands of an insulating varnish high dielectric properties and mechanical strength, plus resistance to dampness and heat.

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NEW TENDERS — Contd.

Water Filtration Plant, for Municipality of Glen Innes. Aug. 31.

VICTORIA

CITY OF MELBOURNE.

Isolating Switches, 440 volt. (Spec. 731/E). Sept. 25.

L.T. Oil Circuit Breakers and Current Transformers (Spec. 732/E). Sept. 25.

DEPARTMENT OF PUBLIC WORKS.

Heat Storage Cooker, for Carlton. Aug. 15.

Heat Storage Cooker, for Jane-field. Aug. 15.

Kerosene Hot Water Service, for Winchelsea. Aug. 15.

GOVERNMENT RAILWAYS DEPARTMENT.

Metal Gates. Aug. 30.

Miscellaneous Items: Adzes, Axes, etc.; Saws and Hack Saw Blades; Augers; Screws and Split Pins; Nails; Dies, Taps, etc.; Porcelain Insulators, etc.; Low Voltage Lamps and Torch Accessories; Accumulator Cells, Batteries; Insulated Cable; Resistance and Winding Wires; Bare Copper Cable and Wire; Various Wire; Galvanised Steel Wire; Steel Wire Rope; Galvanised Iron Sheets; Bright Steel Bars; Iron Piston Castings; Brass Lock Castings; Fire Bricks, etc.; Foundry Coke; Portland Cement; Concrete Troughs; Books, etc.; Paper Bags, Drawing Paper; Carbon Paper. Aug. 16.

Printers' Ink; Rubber Stamps; Bottles, Tumblers, etc.; Corks; Bungs, etc.; Chemicals; Heliographic Process Materials; Photographic Materials; Disinfectants; Methylated Spirits and Turpentine Substitute; Industrial Gases and Calcium Carbide; Tapes and Webbing; Canvas, Canvas Goods; Leather Gloves; Wool Yarn, Hanks and Skeins; Pneumatic and Solid Tyres; Corrugated Jointing Rings; Crude Salt; Steel Cabinets and Lockers; Locks and Keys; Insulating Materials; Mica and Mica Products; Varnishes; Enamel and Lacquer; and Tool Tips. Aug. 23.

S.S. Sheet and Electronic Air Filtering Equipment. Aug. 23.

(Turn to page 73.)

OFFICE MACHINES AND OFFICE SYSTEMS

FACTORY JOB CLOCKS. Models for up to 18 to 50 employees. £48. Various other models up to £81/10/-.

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NEW TENDERS — Contd.

MELBOURNE AND METRO- POLITAN BOARD OF WORKS.

Air Winches (3). Aug. 15.
Angle and Dozer Blade, for
Tractor. Aug. 15.
Centrifugal Pumping Units, 3-
inch, self priming. Aug. 15.
Crushing Plant, gyratory cone
type. Aug. 15.
Pillar Ball Hydrants (200),
single type. Aug. 15.
Steel Rails (60 lb.), 40 ton. Aug.
15.
Tractor, Trailer and Plough.
Aug. 29.

STATE ELECTRICITY COM- MISSION.

Automatic Telephone Equipment
(Spec. 50-51/13). Extended to
Aug. 30.
Automatic Telephone Apparatus
(Spec. 50-51/35). Extended to
Aug. 30.
Centrifugal Pumps, electric motor
driven (Spec. 50-51/63). Oct.
18.
Diesel Engine Crawler Tractors
(Spec. 50-51/69). Aug. 30.
Induced Draft Fans, Steel Flues,
Dust Eliminators and Steel Hous-
ing (Spec. 50-51/5). Sept. 13.
Junction or Link Boxes (Spec.
50-51/40). Aug. 30.
Lathe (Spec. 50-51/76). Aug. 30.
Mine Winders (3), 5 ton electric
driven (Spec. 50-51/75). Aug. 30.
Mobile Cranes (Spec. 50-51/78).
Sept. 6.
Rubbish Incinerator (Spec. 50-
51/42). Aug. 30.
Sensitized Paper and Linen
(Spec. 50-51/72). Aug. 16.
Steel Pipes, for Tyers River
Water Supply (Spec. 50-51/73).
Aug. 23.
Structural Steel Gate (Spec. 50-
51/16). Aug. 23.
Trailing Cable, V.E.L., T.R.C.S.,
6.6 K.V. (Spec. 50-51/68). Nov.
15.

MISCELLANEOUS.

Electrical Materials Bare Cop-
per Cable, High Tension Insula-
tors, Ironwork, Transformers and
Switchgear. Aug. 28.
Materials: Lubricating Oils and
Greases; Power Kerosene and Dis-
tillate, for City of Mildura. Sept.
11.
Mechanical Street Sweeper, for
Shire of Mildura. Sept. 11.

CURRENT TENDERS

The following tenders have
appeared in previous issues
and are still current.

COMMONWEALTH

POSTMASTER-GENERAL'S DEPARTMENT.

Bells and Bussers (Sch. C-
6352). Sept. 21.
Bimotional Switch Armatures
and Associated Parts (Sch. C-
6356). Sept. 21.
Bimotional Switch Parts (Sch.
C.6344). Sept. 14.

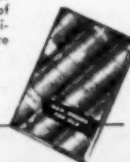
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DRUMS FOR HARDWARE TRANSPORT

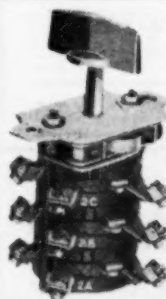
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MU 6352

WEST. AUST.: S. Y. Garnsworthy, 60 St. George's Terrace, Perth. B 3999.

Don Spot Welders

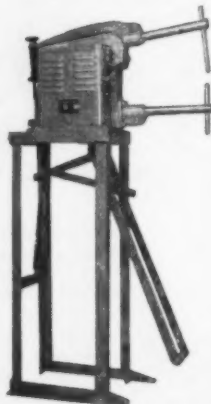
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- Isolating switch and water cock provided.
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- Water circulation system visible to operator.

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BR. 1.4

CURRENT TENDERS — contd.

Brass Rod (Sch. C.6370). Aug. 15.

Brass Sheet and Strip (Sch. C.6371). Aug. 15.

Communication System between Sydney and Melbourne (Spec. C.8157). Extended to Jan. 18, 1951.

Cords, Switchboard Types (Sch. C.6372). Oct. 12.

Dial Parts (Sch. C.6338). Oct. 3.

Lamps, Caps and Sockets (Sch. C.6324). Aug. 15.

Maintenance Parts, for Telephone Equipment (Sch. C.6314). Oct. 5.

Pole Caps (Sch. C.6335). Aug. 31.

Semi Automatic Trunk Exchange Equipment, for Sydney Trunk Exchange (Sch. C.6025). Extended to Sept. 26.

Switchboards, Cordless (Sch. C.6360). Extended to Aug. 31.

Transmitting Tubes (Sch. C.6353). Sept. 26.

DEPARTMENT OF SUPPLY AND DEVELOPMENT.

Bread Slicing and Buttering Machine. Aug. 15.

Diesel Electric Generating Equipment. Sept. 5.

Lathes (3), with 8½, 7 and 6½ inch centre, Short Gap Beds, Purchase of. Aug. 15.

Radio Beacon Equipment. Sept. 5.

Scrap Shell Steel Copper and Brass, Purchase of. Aug. 15.

DEPARTMENT OF WORKS AND HOUSING.

Cables and Auxiliary Equipment. Aug. 22.

Doors, 1,600, Flush Panel and others, for Canberra. Aug. 15.

Galv. Steel Sheets, various sizes and gauges, approx. 800 tons (Item 26). Aug. 29.

Lathe, Elec. Driven, 8½ in. Centre, for Yarralumla. Aug. 15.

Lighting Fittings. Aug. 22.

White Glazed Earthenware Wash Basins and Fittings, 750. Aug. 15.

GOVERNMENT RAILWAYS DEPARTMENT.

Diesel Powered Rail Cars, 4 ft. 8½ in. gauge. Oct. 3.

Goggles, etc. (Sch. 184). Aug. 15.

Steel Sleepers. Sept. 12.

STATES

NEW SOUTH WALES

GOVERNMENT RAILWAYS DEPARTMENT.

All Geared Head, centre Lathe, 10 inch (Quot. CE-1098). Sept. 7.

Bar Bending Machine (Quot. CE-1095). Sept. 6.

Ceiling Lamps, to Drawing (CE-1114). Aug. 30.

Compression Ignition Oil Engines (10), 500 B.H.P., vertical or vee type, high speed, multi cylinder (Spec. 2205). Aug. 30.

Capstan or Turret Lathe (Quot. CE-1097). Sept. 7.

Drilling Machine, 3 speed, pedestal (Quot. CE-1092). Sept. 6.

Drilling Machine, high speed (Quot. CE-1093). Sept. 6.

Drilling Machine, 4 spindle (Quot. 1102). Sept. 7.

Electric Bench Grinder, cap. 2 inch (Quot. CE-1090). Sept. 6.

Electric Overhead Travelling Crane (75 ton), (Spec. 504). Sept. 20.

Electrically Operated Stills, for Distilling Water (CE-1115). Aug. 14.

Goggles, etc. Aug. 16.

Ignition and Distributor Spare Parts. Aug. 16.

Indoor Type Oil Circuit Breakers, 6,000 volt, 75 M.V.A., for Awaba State Coal Mine Substation (Spec. 1286). Aug. 30.

Indoor Type Oil Circuit Breakers, 415 volt, for Awaba State Coal Mine Substation (Spec. 1287). Aug. 30.

Insulators and Pins, for electrical works. Sept. 6.

Lathe, 6½ inch centre (Quot. CE-1091). Sept. 6.

Openside Planer (Quot. CE-1104). Sept. 7.

Pipe and Bolt Screwing Machine (Quot. CE-1096). Sept. 6.

Power Hack saw, 14 inch, belt driven (Quot. CE-1094). Sept. 6.

Radial Drill, 5 ft. (Quot. 1101). Sept. 7.

Rectifier Units (4,000 KW) and Energy Dissipating Resistor Units (Spec. 1258). Extended to Sept. 6.

Rectifier Units (4,000 KW) and Energy Dissipating (Spec. 1253). Extended to Sept. 6.

Relay Tops (CE-1147). Aug. 28.

Screwing Machine, with screwing head (Quot. CE-1088). Sept. 5.

(Turn to page 75.)

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CURRENT TENDERS — contd.

Shaping Machine, 14 inch stroke (Quot. CE-1083). Sept. 5.
Shaping Machine, 24 inch stroke (Quot. CE-1084). Sept. 5.
Slotting Machine, 12 inch stroke (Quot. CE-1082). Sept. 5.
Special Alloy Castings. Aug. 16.
Surfacing and Boring Lathe, 20-24 inch (Quot. CE-1099). Sept. 7.
Universal Drilling Machine, 4 ft. 9 inch radius (Quot. CE-1103). Sept. 7.

Vertical Boring Machine, 60 inch single head (Quot. CE-1085). Sept. 5.
Vertical Boring Machine, 54 inch double head (Quot. CE-1086). Sept. 5.
Vertical Boring Machine, 48 inch double head (Quot. CE-1087). Sept. 5.
Vertical Boring Mill, 48 inch (Quot. CE-1100). Sept. 7.
Vertical Milling Machine (Quot. CE-1105). Sept. 7.
Winches, Elec. Operated (CE-1118). Aug. 21.

DEPARTMENT OF PUBLIC WORKS.

Deep Well Pumping Plant, Elec. Driven (83-49/50), for Gun-nedah Water Supply. Sept. 18.
Dental X-Ray Unit, for Dental Hospital. Aug. 28.
Elec. Driven Pumping Plant, for Mittagong Water Supply. Aug. 28.
Elec. Driven Overhead Travelling Cranes and Gantry, for Clarence River Works (Con. 70-49/50). Sept. 18.
Elec. Driven Pumping Plant, for Klama Water Supply. Aug. 14.

Excavator, Diesel Engine. Aug. 16.
Laundry Machinery, for Lidcombe. Aug. 28.
Locomotives, Diesel. Extended to Aug. 16.
Low Pressure Refrigerating Plant, for Bathurst. Aug. 14.
Low Pressure Refrigerating Plant, for Lidcombe Hospital. Aug. 28.
Mobile X-Ray Unit, for Darlinghurst. Aug. 28.
Mobile X-Ray Plant, for Lismore. Aug. 21.

(Turn to page 76.)



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CURRENT TENDERS—contd.

Mobile X-Ray Unit and Accessories, for Urana. Aug. 21.

Mobile X-Ray Plant and Accessories, for Coonabarabran. Aug. 21.

Thimbles, Shackles, Crosby Clips. Aug. 23.

Vacuum Pumps, Elec. Driven, for Port Macquarie Water Supply (111-49/50). Sept. 4.

X-Ray Plant and Accessories, for Wellington District Hospital. Aug. 21.

DEPARTMENT OF WORKS AND HOUSING.

Carpets, Underfelt, Table Covers and Curtains, for Moorebank. Aug. 15.

Diesel Alternator (150 K.V.A.), for Turramurra. Aug. 22.

Hot Water and Steam Reticulation and Ventilation, for Goulburn. Aug. 22.

Ready Mixed Concrete, 450 cub. yds., for Lidcombe. Aug. 17.

Tables, for Moorebank. Aug. 22.

METROPOLITAN WATER, SEWERAGE AND DRAINAGE BOARD.

Annealed Phosphorus De-Oxidised Copper Strip. Aug. 15.

Annealed Phosphorus De-Oxidised Copper Strip, 12 in. wide by 21 S.W.G., in Rolls, for Warragamba Dam. (Job 2445). Aug. 15.

Automatic Inlet Control Valve, with control mechanism. Extended to Aug. 15.

Chisel Bits, Tungsten Carbide (1,000). (Quot. 7796). Aug. 17.

Diamond Drills and Drilling Equipment, Lightweight Air Motor Driven, Hydraulic or Screw Feed, Underground Type, up to 30 (Tender 381). Sept. 5.

M.S. Framed Screens (120) and 12 Dummies, for Pipe Head Screening Chambers (Job 2443). Aug. 22.

M.S. Pressings and Stampings and Galv. M.S. Groove Covers, for Contraction Joint Grouting, for Warragamba Dam (Job 2444). Aug. 15.

M.S. Pressings and Stampings and galvanised m.s. Groove Covers. Aug. 15.

Pneumatic Rock Picks (21), Pneumatic Chipping Hammers (7), Pneumatic Spaders (19), together with groups of Spare Parts for same, Purchase of (Tender 382). Aug. 22.

Power Operated Crane Attachment (11 tons). Aug. 22.

Pumping Units (2), elect. driven, vertical spindle, centrifugal type, for Upper Cordeaux Pumping Station. Extended to Aug. 15.

SYDNEY COUNTY COUNCIL.

Aerial Pilot Cable and Accessories (Spec. 1433). Extended to Aug. 17.

Cable (1,500 yds.), single conductor, paper insulated and lead alloy, sheathed, 11,000 volt. Aug. 23.

Compressor Switchboard (440 volt.), for Bunnerong Power Station (Spec. 1441). Extended to Sept. 7.

(Turn to page 77.)

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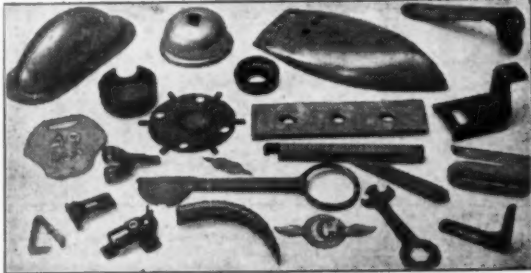
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CURRENT TENDERS - contd.

Insulators and Fittings, for Outdoor Service (Spec. 1435). Oct. 12

Metal Clad Neutral Switching Equipments, 6000 volt, for sub-stations (Spec. 1418). Extended to Aug. 31.

Metal Clad Switchgear (11,000 volt, 250 MVA), for City Sub-station (Spec. 1382). Extended to Aug. 31.

Metal Clad Switchgear (33,000 volt.), for Homebush Sub-station (Spec. 1403). Aug. 17.

Motor Operated Time Switches (30), synchronous, 10 amp., 240 volt., with mechanical storage and astronomical dial. Aug. 28.

Oil Immersed Fuse Switches, 11,000 volt. (Spec. 1421). Sept. 28.

Outdoor Combined Switches and Fuses, 11,000 volt., high rupturing capacity (Spec. 1420). Aug. 31.

Power Transformers (45 MVA), for Homebush Sub-station (Spec. 1419). Extended to Sept. 28.

Precision Lathe, 8 inch swing, and Accessories (Spec. 1425). Sept. 7.

Substation Relay Group Equipment, for City A.C. Network Signal Equipment (Spec. 1408). Aug. 17.

Trailer Caravans (12), two wheels (Spec. 1436). Extended to Aug. 17.

Vacuum Cleaning Plant, fixed type, motor driven, for Fyrmont "B" Power Station (Spec. 1429). Extended to Sept. 7.

MISCELLANEOUS.

Air Break Isolating Switches (77), 33,000 volt., for Newcastle City Council. Extended to Sept. 7.

Diesel Road Roller, 10-12 tons, for Shire of Nambucca. Aug. 21.

Air Compressor, Two Wheel, Pneumatic Tyred, Diesel or Petrol Engine, with Jackhammer, suitable for 1 in. Hex. Hollow Core Rock Drills, capable of drilling to a minimum depth of 16 ft. and two 60 ft. lengths of Air Hose with Couplings, for Shire of Kearsley. Aug. 22.

Earth Boring Plant, for Shire of Amaro. Aug. 14.

M.S. Plates, approx. 300 tons, for New Zealand County Council. Aug. 21.

Mild Steel Plates (300 tons), for New England County Council. Aug. 21.

Plant: Heavy patrol grader, Diesel engine, tandem drive; 12 ft. blade and scarifier; Heavy bulldozer, blade not less than 10 ft. and capable of pitch and tilt attachments, for Stroud Shire Council. Aug. 14.

Power Scarifier Grader, approx. 13,000 lb., for Shire of Windouran. Aug. 16.

Road Plant: Tractor, fitted Angledozer Attachment; Tractor, fitted Tournaloader; 12 tons Low-loading Semi-trailer, 25 ft. x 8 ft.; Primer Moving Unit, 4 x 4. Purchase of, from Shire of Nambucca. Aug. 13.

Watt-hour Meters, 5 amp. and 10 amp. (200), Purchase of, from Municipality of Penrith. Aug. 21.

VICTORIA

GOVERNMENT RAILWAYS DEPARTMENT.

Radial Drilling Machine. Aug. 16.

Slotting Machine. Aug. 16.

Traction Motor Armature Laminations and Dies. Sept. 6.

(Turn to page 78.)



This MARINO FLEXIVANE PUMP

ran continuously for

3,500 HOURS

(except for an inspection at 2020 hrs.)

During this test run the Flexivane received no attention or lubrication whatsoever. The only repair necessary after the inspection at 2020 hours was the gland seal, which was replaced at a cost of 1/3. The performance over this whole exacting test run has been outstanding. The Pump has already given the equivalent of well over 20 years' normal service.

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CURRENT TENDERS — contd.

COMMONWEALTH RAILWAYS DEPARTMENT.

Axle Lathe, double ended. Sept. 3.

CITY OF MELBOURNE.

Air Conditioning Plant (Spec. 728/E). Aug. 21.

DEPARTMENT OF WORKS AND HOUSING.

Materials: Approx. 1240 Rolls of Galvanised Wire Netting; approx. 335 tons of Galvanised Barb Wire; approx. 300 tons of Galvanised Plain Wire; approx. 1,500 chains of Wire Mesh; approx. 50 rolls of Galvanised Chain Wire, for various States. Aug. 29.

Nails (4651 tons), various types and sizes. Aug. 15.

MELBOURNE AND METRO- POLITAN BOARD OF WORKS.

Air Winches (3). Aug. 29.
Centrifugal Pumping Units (8 inch), self priming. Aug. 29.

Crushing Plane, one unit gyratory cone type. Aug. 29.

O.H. Crane (4 ton), hand-operated. Extended to Aug. 29.

Farming Plant: Tractor, Trailer, Plough, etc. Aug. 28.

MELBOURNE AND METRO- POLITAN TRAMWAYS BOARD.

Annual Supply of Stores: Rope Twine and Cordage (Sch. 21), Brooms and Brushware (Sch. 22), Packings and Jointings (Sch. 23), Leather and Beltings (Sch. 24), Soaps, Polishes and Disinfectants (Sch. 26), Transfers, Nickel Silver Notice Plates (Sch. 28), Floorings, Bituminous, Linoleums, etc. (Sch. 31), Strap Hanger Handles (Sch. 37), Trolley Poles and Accessories (Sch. 45), Springs (Sch. 47), Brushes, Carbon, etc. (Sch. 49), Ball and Roller Bearings (Sch. 50). (Tender 1595). Aug. 14.

MELBOURNE HARBOUR TRUST.

Fuel Truck. Extended to Aug. 18.

Low Loading Trailer. Extended to Aug. 18.

STATE ELECTRICITY COM- MISSION.

Belt Conveyor System (Spec. 50-51/4). Extended to Aug. 30.

Boring and Turning Mills, vertical (Spec. 50-51/48). Aug. 23.

Cadmium Copper Conductor (Spec. 50-51/27). Aug. 23.

Compressed Air Driven Winches (Spec. 50-51/46). Aug. 18.

Control Cable, V.R. or P.C.I. (Spec. 50-51/1). Aug. 18.

Distribution Transformers, 6,600 volt, and 22,000 volt. (Spec. 50-51/19). Sept. 27.

Electric Lamps (Spec. 50-51/24). Aug. 18.

Hydraulic Press, Guillotine Shearing Machine and Press Brake (Spec. 50-51/67). Aug. 23.

Induced Draft Fans, Steel Flues, Dust Eliminators and Structural Steel Housing (Spec. 50-51/5). Aug. 16.

O. H. Travelling Crane, electrically operated (Spec. 50-51/18). Extended to Aug. 18.

Outdoor Switchgear and Accessories, 66,000 and 22,000 volt. (Spec. 50-51/6). Aug. 16.

Transformers (66 kv. and 22 kv.). (Spec. 49-50/3). Sept. 13.

STATE RIVERS AND WATER SUPPLY COMMISSION.

Centrifugal Pumps, two, with Vee Pulleys, one Centrifugal Pump, for Electric Motor Drive. Aug. 22.

MISCELLANEOUS.

Front End Loader, approx. 4 cu. yd. capacity, for Shire of Deakin. Aug. 17.

Intense Cooling Plant and Station Meter, for City of Mordialloc. Aug. 14.

QUEENSLAND

GOVERNMENT RAILWAYS DEPARTMENT.

Diesel Electric Locomotives (10). Aug. 31.

STATE ELECTRICITY COM- MISSION.

Steam Turbo Alternators (Spec. 200). Aug. 30.

Steam Turbo Alternator (Spec. 196). Aug. 18.

Water Tube Boilers (Spec. 200). Aug. 30.

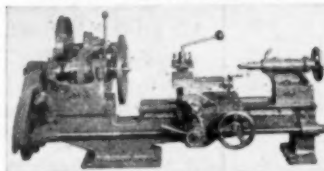
STATE STORES BOARD.
Wire and Wire Netting, for various Departments. Aug. 15.

MISCELLANEOUS.

Engine-driven Alternator Sets (2), 750 KW, complete, for Cairns Regional Electricity Board. Oct. 11.

(Turn to page 79.)

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CURRENT TENDERS - contd.

SOUTH AUSTRALIA

**SUPPLY AND TENDER
BOARD.**

Air Conditioning Equipment. (18 Sets). Extended to Aug. 28.
Ammeter, d.c. recording, portable; portable electric Traction Recording Meter. Aug. 21.

WEST AUSTRALIA

**GOVERNMENT TENDER
BOARD.**

All Steel Crusher and Elec. Motor. Aug. 17.
C.I. Sluice Valve (36 inch), for Wellington Dam. Aug. 24.
C.I. Sluice Valve (21 inch), for Wellington Dam. Aug. 24.
Cast Steel Manganese Steel Crossings, for Railways. Sept. 14.
Diesel Mechanical Shunting Loco. Oct. 3.
Diesel Mechanical Locomotives (18). Extended to Aug. 17.
Diesel Mechanical Shunting Locomotives. Oct. 5.
Diesel Electric Main Line Locomotives (48). Extended to Aug. 24.
Fishbolts and Spring Washers. Sept. 7.
Fishbolts and Spring Washers, for Railway Department. Sept. 7.
Mild Steel Plate, 3/16 in. and 1 in., 4,670 tons and 3,496 tons. Aug. 17.
Mild Steel Plate (4,070 tons), 3/16 and 1/2 inch. Aug. 17.
Mild Steel Plate (3,496 tons), 3/16 and 1/2 inch. Aug. 17.
Railway Car and Waggon Tyres. Oct. 12.
Railway Waggon. Sept. 7.
Sluice, Air and Reflux Valves. Aug. 31.
Railway Wagons, for Railways Dept. Sept. 7.

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MISSION.**

Valves:—Two 72-in. Valves, for Trevallyn Power Development; two 54-in. Control Valves, for Lake Augusta Storage; two 60-in.

Gate Valves, for Trevallyn Power Development; two 42-in. Gate Valves, for Lake Augusta Storage; two 42-in. Gate Valves, for Nive Power Development. Aug. 31.

**PUBLIC WORKS DEPART-
MENT.**

Stop Vales and Air Valves, for North Esk Regional Water Supply. Extended to Aug. 16.

MISCELLANEOUS.

Miscellaneous Piping, Cast Iron, Asbestos Cement, or Mild Steel Pipes, for the Trunk Mains; Valves for Trunk Mains; Cast Iron Pipe Specials for Main from Lindisfarne to Bellerive; Cast Iron or Asbestos Cement Pipes for Lindisfarne, Montague Bay, and Bellerive Reticulation; Valves for Reticulation Mains at Lindisfarne, Bellerive, and Montague Bay; Cast Iron Pipe Specials for Lindisfarne, Montague Bay, and Bellerive Reticulation, for Municipality of Clarence. Aug. 21.
Pressure Pipes, cast iron or asbestos cement, for Municipality of Longford. Aug. 21.

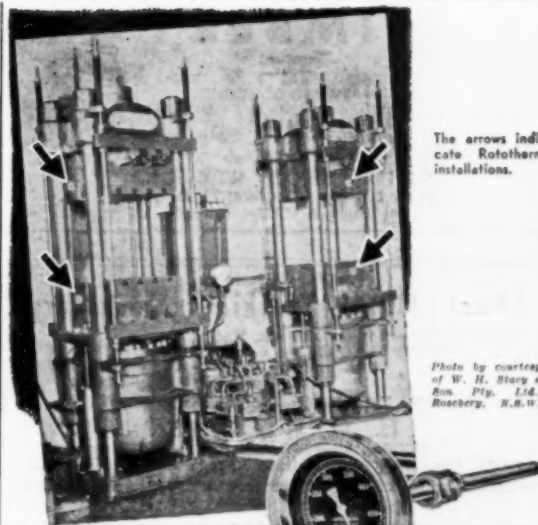
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VICTORIA

DEPARTMENT OF EDUCATION.

Motor mechanics' equip., H.S. Hamilton, Shepparton, Swan Hill and Warragul, £405. Machin & Co. Ltd.
Motor mechanics' equip., H.S. Hamilton Shepparton, Swan Hill, and Warragul, £422. James Walker Pty. Ltd.
Motor mechanics' equip., H.S. Horsham, £175. Brooklands Accessories Ltd.; £216. Repco Replacements Party Pty. Ltd.; £125. A. G. Healing Ltd.
Metallurgical microscope, Baker, and accessories, £185. N. H. Seaward Pty. Ltd.
Pye television transmitting and receiving equip., £4,000. Electronic Industries Ltd.
Engine, Holden, with clutch generator, distributor, carburettor, water pump and fan, £141. Tractor and Implements.

(Turn to page 80.)



The arrows indicate Rototherm installations.

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Hausen & Co., 183 Pirie Street, Adelaide—Radiators specialists.

Huclin, R. G., 48 Holbrook Road, Underdale—Cement products.

Ilman, C. G., 289B South Road, Ashford—General engineer.

Kerrison, J. J., 179 Port Road, Queenstown—Tailoring.

Moschis, Con., Thevenard—Tailoring.

Walker & Sons, 17 Humphries Terrace, Kilkenny—Builders and structural engineers.

Youldell, M. W., 48 Collins Street, Enfield—Box and case manufacturer.

Late Open Tenders

NEW SOUTH WALES

POSTMASTER-GENERAL'S DEPARTMENT.

Cotton Waste (N.S.W. 478). Sept.

High Frequency Preheater (N.S.W. 462). Aug. 18.

VICTORIA

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Draft Proof Windows (6). Aug. 18.

Electrical Control Equipment, for 5 winches of Grab Barge. Aug. 25.

Galvanised Sheet Iron Eaves, Guttering and Downpipes. Aug. 18.

Motor Timber Jinker. Aug. 25.

MISCELLANEOUS.

Front End Shovel Loader, Purchase of, from Shire of South Gippsland. Aug. 21.

(Turn to page 81.)

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LATE OPEN TENDERS—Contd.

Gang Mower, light, horse or tractor drawn, for City of Newtown and Chilwell. Aug. 18.

Mechanical Road Broom, for Shire of Lillydale. Aug. 21.

Pipes, 26.858 in. ft., 9 inch diameter, for Euroa Waterworks Trust. Aug. 19.

Single-berth Caravans (3), with pneumatic tyres, for Shire of Glenelg. Aug. 18.

QUEENSLAND

BRISBANE CITY COUNCIL.
All Geared Head Engineers' Lathes. Sept. 8.

Chlorinators (4). Sept. 1.

Earth Hole Boring Machine. Sept. 22.

Fork Lift Truck, petrol driven. Sept. 8.

O.H. Travelling Crane. Sept. 15.

Piping, h.p. steam, feed, drain, and blowdown, valves and lagging. Oct. 20.

Portable Air Compressors. Sept. 8.

Ring Main Switchgear, 11kV. Oct. 20.

Underground Cable, 11,000 v. and 660 v.; Pilot Cable and Jointing Material. Sept. 22.

STATE ELECTRICITY COMMISSION.
Coal Burning Gas Producers (3). (Spec. 227). Oct. 18.

Coal Burning Gas Producers (3). (Spec. 228). Oct. 18.

Powerhouse Switchboard. Aug. 23.

Transformer, 33/11 KV and Regulator (Spec. 223). Sept. 27.

Water Circulating Valves, low pressure (Spec. 216). Sept. 6.

Water Tube Boilers (Spec. 224). Oct. 25.

IRRIGATION AND WATER SUPPLY.
Mobile Bore Hole Pumps (10). Aug. 25.

Windmill and Pumping Equipment (Job 1521). Aug. 28.

MISCELLANEOUS.
Plant: Washing Machines; Hydro Extractors; Shaker Tumblers;

Ironing Machines and Drying Tumblers, for Brisbane Hospital Board. Aug. 23.

Sewer Pipes and Specials, for South Coast Town Council. Aug. 22.

Sluice Gate and Headstock, for Jericho Shire Council. Sept. 5.

SOUTH AUSTRALIA

POSTMASTER-GENERAL'S DEPARTMENT.

Caravans (S.A. 957). Sept. 1.

GOVERNMENT RAILWAYS DEPARTMENT.

Acid Tanks (30), 4,500 gals. Aug. 17.

SUPPLY AND TENDER BOARD.

Brass Radiator Tubing, seamless drawn. Sept. 4.

Electric Furniture, high temp., high speed. Aug. 14.

Flameproof Cables and Jumper Cable. Aug. 14.

Machines, for paint grinding and mixing plant. Aug. 14.

Precision Grinding and Dispersion Mill, for Paints. Aug. 14.

NEW ZEALAND

HYDRO-ELECTRIC DEPARTMENT.

Control and Relay Boards, 11kV. Aug. 23.

Suspension Insulators and Strain Clamps. Sept. 14.

Synchronous Condensers (2), 30,000 KVA. Nov. 21.

Transformer Bank and Spare Unit, 10,000 KVA. Oct. 3.

Transformer Banks and Spare Units (2), 50,000 KVA. Oct. 10.

MISCELLANEOUS.

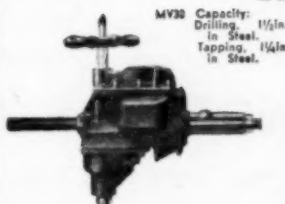
Dredger, with pipelines, pontoons and accessories, for Nelson Harbour Board. Sept. 18.

Electric Cranes, semi-portable (4), 2-ton, for Wellington Harbour Board. Sept. 4.

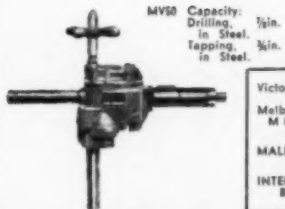
O.H. Electric Cranes (8), 2-ton, for Wellington Harbour Board. Oct. 4.

Sewerage Pumps (2), electric motor driven, and fittings, for Wellington City Council. Sept. 29.

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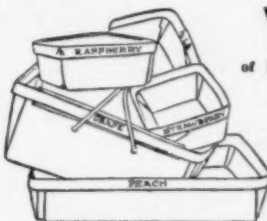
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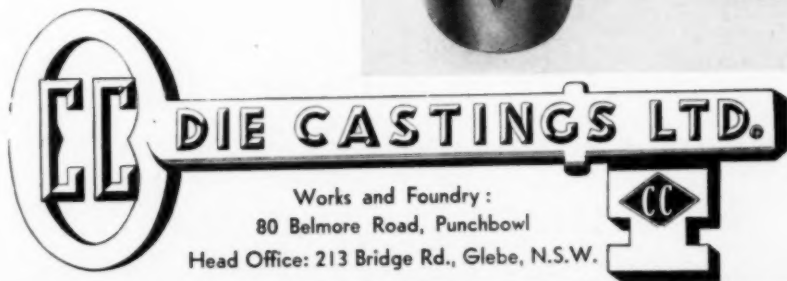
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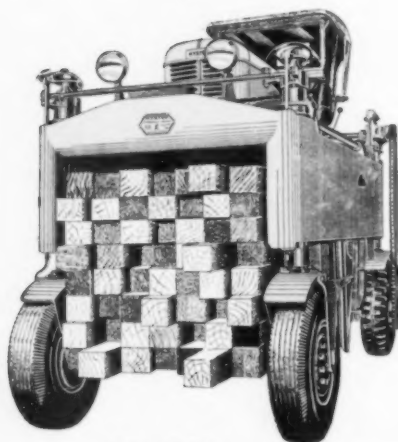
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